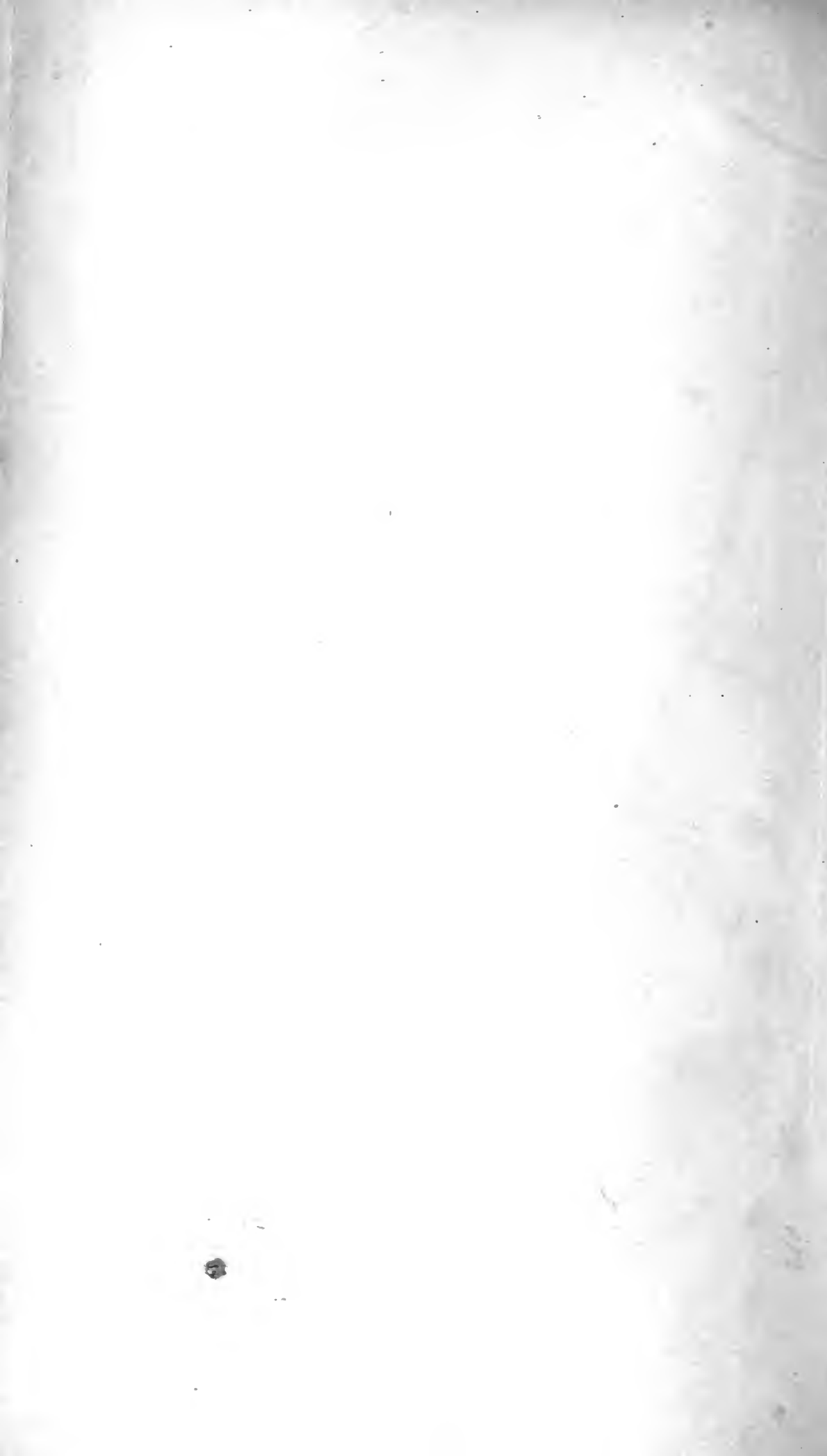




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THE
DENTAL RECORD:

A
MONTHLY JOURNAL
OF
DENTAL SCIENCE, ART, AND LITERATURE,
DEVOTED TO THE INTERESTS OF THE PROFESSION.

EDITED BY
THOMAS GADDES, L.D.S.ENG. AND EDIN.

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I N D E X.

	PAGE
Abnormal Teeth.	265
Abnormalities in Animals	108
Absorption of Root, Case of	261
Acetate of Aluminium	150
Ackland, J. M., on Neuralgia and Dental Irritation	203
Address, Inaugural	115, 359, 441
„ Valedictory	61
„ by Sir John Tomes	434
Additions to Museum of Odontological Society	267
Adenoma of Palate	271
Albert, H. L., on Fatal Case of Hæmorrhage	85
Aluminium Bronze in Dentistry	344
Alveolar Abscess	2, 158
„ „ Death from	477
Alveolo-dental Membrane	36
Amalgam	522
Amendments of Dentists' Act	332
Annotations	46, 143
Answers to Correspondents	48
Antique Brass	288
Antiseptics, Testing the Power of	329
Appointments, Dental	252, 302
Appreciation of Dentistry	518
Aqua Calcis	282
Articulation, Imperfect	2
Arsenious Acid on Pulp	223
Artificial Nose, Lip and Jaw	223
 Bate, C. Spencer, Valedictory Address	 61, 142
Bate, F. W., Obituary	34
Bellamy, F. A., on the Hodge Hand Piece	12
„ on A Logical Inference	492
Best, Dr. A. H., Obituary	186
Bödecker, Dr., on Polishing Fillings	13
Book Reviews	543
Boric Acid and Affections of Mouth	353
Brass Antique	288
Bridge Work	379
British Dental Association	369, 434
Southern Counties	359
Western	368
Central	513
British Dental Association v. Blake	34
Broken Forceps in Bronchus	28, 46, 78
Buxton, Dr. D., on Nitrous Oxide	171

	PAGE
Calcific Deposits in Pulp	327
Calculus, Salivary	159
Calculi, Tonsillary	304
Cancrum Oris	512
Cases of Interest.	2
Catalepsy	286
Cataract and Defective Teeth	13
Catarrh	96
Charts, Record	6, 27
Childrens' Teeth	121, 468
Chloroform, Death from	176, 576
Chronic Ptyalorrhœa	317
Cleft Palate, A Case of.	97
Closure of Jaws	53
Cocaine 5, 56, 145, 191, 238, 241, 263, 311, 374, 523	
Coles, Oakley, Testimonial	32, 131
Coleman, Alfred	46
Colouring Artificial Teeth.	321
Continuous Gum Work.	58, 78, 228
Cormack, E. A., on Mucous Membrane of Mouth	208
Correspondence :—	
Fletcher's " Practical Hints "	42
Cocaine	238
County Court Cases	31
Cow-pox and Small-pox	575
Crapper, J. S., on Treatment of Irregularity	50
Cunningham, Dr. G., on Record Charts	6, 27
" " on Continuous Gum Work	58
" " on Dentistry in Relation to State	464
" " on Professional Holiday	464, 494, 539
Cunningham, M. G., Metal facing on Rubber	566
Curved Teeth in Animals	111
Cysts, Pathology of	30
" Dentigerous	28, 159
" Simple in Upper Jaw	262
 D.D.S., or M.D., Which	 373
Dangers in Dental Operations	185
Davy, R., on Excision of Condyle of Jaw	502
Dead Teeth, Treating	19
Death from Alveolar Abscess.	158, 477
" " Chloroform	177, 576
" " Replantation	186
" " Hæmorrhage after Tooth Extraction	85
Defective Teeth and Cataract	13
Dental Caries, A Treatise on 2, 35, 39, 40, 44, 208, 276, 507	
" Mechanics, Lecture on	419
" Engine, Electro	337
" Materia Medica	149, 543
" Abnormalities in Animals	108
" Surgeons at General Hospitals	142
" Bracket, Improved	33

	PAGE
Dental Periosteum	36
„ Manufacturing Co.	178
„ Hospitals.	187
„ Hospital of London	160, 355, 411
„ „ „ Liverpool	79, 414
„ „ „ Manchester	168, 413
„ „ „ Birmingham	413
„ „ „ Glasgow	416
„ „ „ Edinburgh	166, 415
„ „ „ Brighton	321
„ „ „ National	163, 305, 333, 412
„ „ „ Plymouth	415
„ „ „ Exeter	415
„ „ „ Dublin	416
„ Irritation and Tetanus	231
„ „ and Neuralgia	223
„ Appointments	252, 302
„ Literature, Index of	545
„ Syringe	255
„ Chemistry	283
„ Jurisprudence	326
„ Services	377
„ Education	378, 379, 385, 452
„ Schools	411
Dentigerous Cyst.	28, 159
Dentine, Sensitive, Treating	516
Dentists' Act, Amendment of	332
Dentistry, Prehistoric	182
„ in Relation to State	464
„ Popular Appreciation of	518
„ „ Works on	378
Dew-formation	189
Dinner of Odonto-Chirurgical Society	225
Diseases of Ear and Teeth	144
Doll in The Throat	1
Dougan, W., on Pivoting Teeth	195
Ear and Disease of Teeth	144
Editor on Cocaine and Tooth Extraction	145
Editorial:—	
A Teaching University	42
Decay of the Teeth	44
Dental Surgeons at General Hospitals	142
The Dental Hospitals	187
A Plea in Behalf of the L.D.S.Eng.	188
An Insult to British Dentistry	239
Sir John Tomes, F.R.S.	285
Amendments of Dentists' Act	332
National Dental Hospital	333
Passing Events	381
Suggestions to Students	385
Literary Shortcomings	479

	PAGE
Editorial— <i>continued</i> .	
<i>The Lancet</i> and the Dental Profession	525
Educational Sections	385
Electric Battery	321
" Lamp	481
Electro-Dental Engine	337
Electro-Magnetic Mallet—its Construction	529
Elliott, W. T., on Dental Mechanics	419
Enamel, Pathology of	35
" Sections of	54
Epulis	128, 234
" in Animals	108
Epithelioma of Lower Jaw	272
Erosion	118, 281
Ethics	325
Eve, S.F. on Pathology of Cysts	30
Evolution in Pathology	192
Examination Questions	319, 572
Excision of Condyle of Jaw	502
Exposed Pulp	374, 520
Facial Atrophy	576
" Paralysis	47
" Neuralgia	203
Failure of Fillings	90
" in Dental Practice	517
Fatal Case of Hæmorrhage	85
Ferrules in Regulating Teeth	373
Filling Roots	153, 288
Filling Roots with Wax	49
" Soft Teeth	322
Fillings, Polishing	13
Finishing Fillings	13
First Permanent Molars	319
Fisher, Mr., on Teeth of School Children	465
Fisk, W. J., on Dental Appointments	252
Flame Contact in Water Heating	345
Fletcher, T., on Flame Contact	345
Fletcher's "Practical Hints"	42
Forceps, Broken	28, 46, 78
Forshaw, C. F., on Supernumerary Tooth	50, 156
" on Replantation	180
" on Retarded Eruption of Teeth	193
" on Dental Appointments	302
" on Pyorrhœa Alveolaris	424
" Rhymes by	545
Fothergill, Dr. Milner, on Gouty Teeth	99
Fripp, J. T., on Preparing the Mouth	292
Function, Its Evolution and Influence	371
" Therapeutics of	514
Gelatine-forming Micro-Organisms	519
General Medical Council	315, 570

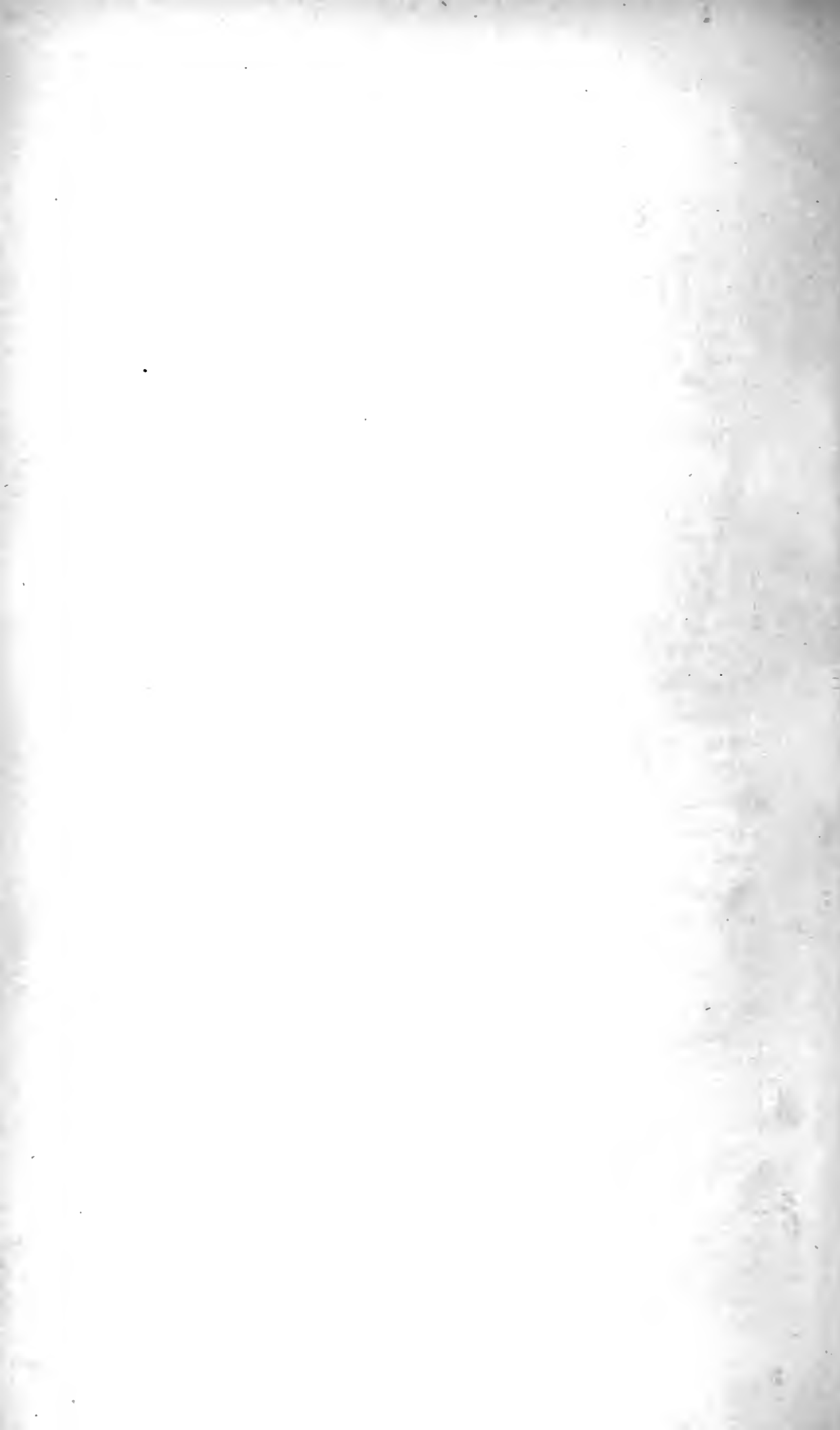
	PAGE
General Medical Schools	417
Germ Cells	95
Glassington, C. W., on a Case of Cleft Palate	97
Gold and Amalgam	322
Gossip 46, 95, 143, 189, 240, 286, 334, 382, 480, 526, 574	574
Gould, Pearce, on Death from Abscess	158
Gouty Teeth	99
Grayson, W., on Filling Roots with Wax	49
Gum Tragacanth	59
Hæmorrhage, Fatal, after Extraction of Teeth	85
„ after Extraction	222, 288
Hare-lip in a Lamb	261
Harper's Tooth-brush	181
Hearn, Wm., on Treating Dead Teeth	19
Heating Water	345
Hepburn, D., Testimonial to	90, 236
„ Duncan, Poems of	545
Herbst's Methods	520
Hodge Hand-piece, The	12
Holmes, Chas., on Pyorrhœa Alveolaris	433
Hospital Reports 48, 96, 143, 186, 240, 284, 334, 382, 528	528
Humphrey, J., on Missing Incisors	546
Hunt, W. A., on Dental Syringe	255
Hydonaphthol	155
Impacted Denture	228
Imperfect Articulation	2
Implantation of Teeth in New Sockets	538
Improved Dental Bracket	33
Inaugural Address	115, 359, 441
Incisors, Missing	270, 130, 261, 546
Index of Dental Literature, Review of	545
Inflammation of Mouth	211
Insult to British Dentistry	239
International Medical Congress	16, 88, 569
Introductory Lecture	419
Iodoform	151
Iodol	152
Iron, Destructive Effects upon Teeth	517
Irregularity, Treatment of	50, 77, 221, 373, 375, 514
Irritation, Dental and Neuralgia	203
Jaw, Removal of	349
Jealousy, Professional	92
Journalistic Summary	35, 90, 182, 276, 322, 371, 514
Jurisprudence, Dental	326
Kempton, H. T. K., Obituary	477
Lacquer, Coloured	383

	PAGE
Lancet, The, and Decay of the Teeth	44
„ „ and the Dental Profession	525
Lakeman, J. J., on Supernumerary Teeth	98
Lamb with Hare-lip	261
L.D.S.Eng., A Plea in behalf of	188
Lime Water	282
Literary Shortcomings	479
Liverpool Dentist and his Client	31
Logical Influence	492
Lupus of Palate	274
Lyons, Isidore, Obituary	331
Magor, J. B., Obituary	478
Maggregor, A. D., on Boric Acid	353
Mahonie, Thomas, Obituary	478
Manchester Odontological Society	513
Man's Lost Incisors	546
Materia Medica, Dental	149, 543
Matrix, a New Form	279
Medical Congress, 1887	16, 88, 569
„ Council	315, 570
Medical Schools	417
Mercurie Chloride	189
Metal Facing on Rubber	566
Meteoroids, Source of	480
Micro-organisms	184, 192, 214, 519
Microscopical Sections of Enamel	54, 312
„ „ of Teeth	75, 81
Miller, Dr. W. D., on Fermentatione	184
„ „ „ Power of Antiseptics	329
„ „ „ Decay of Teeth	507
Missing Incisors.	2, 70, 130, 261, 546
Mouth Inflammatory, Affections of	211, 353, 512
Mucous Membrane of Mouth	205
Naphthal	153
National Dental College	305
Necrosis of Maxilla	193, 266, 349
„ of Bones of Nose	424, 433
Neuralgia and Dental Irritation	203, 233, 492
Neuroma of Parotid Gland	272
New Form of Dental Syringe	255
New Inventions	32, 181, 321
New Remedies	149
Nitrous Oxide	171, 190
Nose, Lip, and Jaw, Artificial	223
Notes on Decay of Teeth	507
Obituary	34, 186, 239, 331, 477
Odontological Society	19, 53, 105, 169, 261, 310, 562
„ „ of Manchester	513

	PAGE
Odonto-Chirurgical Society	70, 121, 208
Œsophagotomy	257
Osteo-dentine	109, 223
Oxford (Radcliffe) Infirmary	139, 142
Palate, Tumours of	271
Palate Lupus of	274
Paralysis, Facial	47
Parasitic Affections of Mouth	214
Pass List	52, 284, 320, 382, 574
Passing Events	381
Pathology of Cysts	30
Patients' Record Charts	6
Penrose, A. P., on Cocaine	238
Peroxide of Hydrogen	185
Phillips' Suction Valve	32
Physiology and Pathology of Mucous Membrane	208
Physiological Action of Nitrous Oxide	171
Pitkins' Pocket Battery	321
Pivoting Teeth	195, 289, 565
Plugger Points with Vulcanite Handles	182
Poetical Works	545
Popular Works on Dentistry	378
„ Appreciation of Dentistry	518
Post Graduate Course	330
Pre-historic Dentistry	182
Preliminary Education	388
Preparing Mouth for Artificial Teeth	292
Preparing for First Molars	319
Presumptive Diagnosis of Gout	99
Professional Courtesies	517
Professional Jealousy	92
„ Holiday	494, 539
Prosecution under Dentists' Act	34
„ of a Dentist	94
Pulp, Action of Arsenic on	223
„ Calcification of	223, 327
„ Exposed	374, 520
Pulpine	32
Pyæmia from Alveolar Abscess	477
Pyorrhœa Alveolaris	39, 424, 427, 433
„ „ in Monkey	270
Radcliffe Infirmary, Oxford	139, 142
Record Charts	6
Registration of Students	387
Regulating Teeth	50, 77, 221, 373, 375, 514
Regulations for L.D.S., &c.	393
Relation between Neuralgia and Dental Irritation	203
Removal of Jaw	349
„ „ Names from Dentists' Register	315, 571
Replantation of Teeth	105, 180, 186, 263

	PAGE
Replantation of Teeth for Hæmorrhage	222
Retarded Eruption of Lower Wisdom Tooth	193
Review of Books	543
Richmond Crown	289
Riggs, Dr., Obituary	34
Root Filling	288
Root Filling with Wax	49
" " with Naphthal	153
Rollins, W. H., on Chronic Ptyalorrhœa	317
Rowney, Thos., on Electro-Dental Engine	337
" " on Electric Lamp	481
" " on Electric Mallett	529
Rymer, S. Lee, Inaugural Address	259
Saliva, Examination of	516
Salivary Calculus	159
Saunders', Sir Edwin, Address	441
Secondary Dentine	223
Secret Preparations	380
Section Making for Microscope	81
Sensitive Dentine Treating	516
Separators	330
Sequel of Caries of Teeth	40
Services, Dental	377
Sex, Causation of	383
Smale, Morton, on Torsion	2
" " on Dental Education	452
Source of Meteoroids	480
Special Dental Schools	411
Spence, S. J., on The Richmond Crown	289
Split Plate for Regulating	77
Stewart, R. J., Obituary	331
Stomatitis	211, 353, 512
Suction Plates	59
Suction Valve, Phillips	32
Suggestions to Students	385
Summary, Journalistic	35, 90, 182, 276, 322, 371, 514
Supernumerary Teeth	50, 98, 156, 382
Sutton, J. Bland, on Dental and Oral Cases in Animals	108
" " on Evolution in Pathology	192
Swallowing Foreign Bodies	1, 28, 46
" Artificial Teeth	257
Syphilis	144
Syringe, New Dental	255
Taft's Index of Periodical Literature, Review of	545
Teaching University	9, 42
Teeth, Sections of	54, 75, 81, 312
" Transplantation of	101, 376, 558
" Gouty	99
" Supernumerary	50, 98, 156
" Replantation of	105, 180, 186, 263

	PAGE
Teeth Retarded Eruption of	193
Testimonial to Oakley Coles.	32, 131
" " David Hepburn	90, 236
Tests for Cocaine.	247
Tetanus	231
Therapeutics of Function	514
Tomes, Sir John	285
Tonsillary Calculi	304
Tonsils, Function of	287
Tooth in Orbit	384
Tooth Brush, Universal	181
Torsion	2
Transplantation of Teeth into New Sockets.	101, 376, 558
Treating Dead Teeth	19
Treatment of Irregularity	50, 77, 221, 373, 375, 514
" of Children	121
Treatise on Dental Caries	2
Tribe, Alfred, Fund	32, 382
Trismus, Mechanical	502
Tubercular Ulceration of Palate.	273
Tumours of Oral Region	271
Universal Tooth Brush	181
University, a Teaching	42
Uræmia, and its effects upon the Teeth	283
Valedictory Address	61
Various Methods of Pivoting Teeth	195
Visick, A.B., Obituary	239
Vulcanising	521
Waite, Dr. W. H.	335
Wallis, C. J. B., A Doll in the Throat	1
" " Improved Dental Bracket	33
" " on New Remedies	149
" " on Cocaine in Dental Surgery	241
Wax for Filling Roots	47
Wedging	324
Wendel, Prof., on Missing Incisors	546
Wherein we Fail	378
White, T. C., on Section Making	81
" " Inaugural Address	115
Wood, J., Teeth and Associate Parts	544
Younger, Dr. W. J., on Transplanting into New Sockets	101, 376, 558



THE DENTAL RECORD.

VOL. VI.

JANUARY 1, 1886.

No. 1.

A DOLL IN THE THROAT.

By C. J. BOYD WALLIS, L.D.S.Eng.

I HAVE thought the following case, which occurred in the practice of my brother, Dr. H. W. Wallis, of sufficient interest for publication in the DENTAL RECORD, particularly as it bears some resemblance to the case brought before the Odontological Society on December 7th by Sir William McCormack (see page 28).

My brother tells me that a female child, aged between six and seven years, was admitted into the Infirmary of the Industrial Schools, Brentwood, suffering from a cough, accompanied, apparently, with spasmodic croup. She was attacked suddenly from time to time with distressing dyspnœa, occasionally almost threatening death from suffocation, and then would as suddenly recover and breathe in a normal manner. This state of things went on for about a fortnight, in spite of medical treatment, when, during one of the paroxysmal attacks, the nurse noticed something expelled from the mouth on to the bed, when the child immediately exclaimed, "Oh, there's my dolly!" which proved to be the case. On being questioned, the child then told the story of having had the doll in her mouth one day, when it suddenly slipped down her throat, which meant, of course, into the trachea—possibly into one of the bronchi—where it seemed to have played "high jinks." All readily accounted for all the symptoms, and solved a very puzzling case.

The accompanying illustration shows the shape and size of the doll, which was made of china.



Fortunately, perhaps, says my brother, for the child, she, like myself, was in blissful ignorance of the real cause of her trouble, otherwise probably I should have opened and explored the trachea, and possibly not have succeeded in accomplishing that which Nature did so effectually after her own fashion. The child, after her "safe delivery," had not any subsequent bad symptoms.

At the time of this occurrence whooping-cough and croup were prevalent in the school: this led my brother and a medical friend who also saw the patient somewhat astray in their diagnosis of the case; and the absence of any marked constitutional disturbance except when the attacks came on, rendered the case still more perplexing. Of course nothing was mentioned by the child of the doll until after its expulsion.

A TREATISE ON DENTAL CARIES.

NOZIONI INTORNO ALLA CARIE DENTALE E SUA CURA. DI
LUIGI RIBOLLA-NICODEMI, Palermo

IN the Preface the Author writes that Dentistry in Italy is confounded with quackery, and is often looked upon as belonging to the province of the conjurer rather than to science. Notwithstanding the progress made in Anatomy, Physiology and Pathology, Dentistry has been left behind. The Royal University has not yet considered this branch of Medicine as a Science and an Art, but has excluded it from the programme of studies. With the object of endeavouring to spread a knowledge of Odontology, and raise it to a higher status, this work has been produced.

The work consists very largely of quotations from literature already published. Many of the woodcuts are reproductions from illustrations which have appeared in the *Dental Record*, and there is no mention made of the source whence they are obtained. The fact of such a compilation in the Italian language is worthy of record, and will not be without its effects upon the neglected specialty in Italy.

CASES OF INTEREST

IN THE DENTAL DEPARTMENT OF WESTMINSTER HOSPITAL.

Reported in the *Westminster Hospital Reports*, Vol. I.

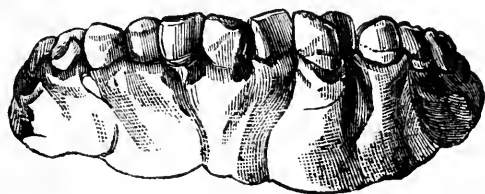
By MORTON SMALE, M.R.C.S., L.D.S.ENG., &c.

TORSION, MISSING INCISORS, IMPERFECT ARTICULATION, ALVEOLAR ABSCESS,
COCAINE.

CASE I.—W. T—, æt. 8, applied to have an upper front tooth twisted. On examination he was found to have the right upper front incisor well erupted, but the mesial edge instead of the

labial surface presenting towards the lip. The left upper front incisor was erupting very slowly, and had hardly appeared through the gum. The tooth was grasped firmly by a pair of straight-bladed forceps and twisted into a good position, care being taken to press the tooth firmly into the socket during the operation. It was tied to the surrounding teeth with silk twist, in order that it should not return to its old position. A week afterwards the tooth was quite firm in the new position, and there had been little or no inconvenience. The boy said "it ached all that day," but from that time there was no pain or discomfort. The tooth could be tapped, and he could distinguish between hot and cold applications. There was no discolouration, and the gum was quite healthy.

Torsion may be used freely before the patient is twelve, and should always be done at one operation. It is only applicable to the incisors.



CASE 2.—The above woodcut represents the mouth of a child who presented himself at the hospital, and is interesting from a comparative odontological point. It will be seen that the patient has the full typical mammalian dentition with regard to the

incisors, the formula for which is $\frac{i}{3} \frac{c}{1} \frac{pm}{4} \frac{m}{2}$, the ordinary dentition

(deciduous) in man being $\frac{i}{2} \frac{c}{1} \frac{pm}{0} \frac{m}{2}$. Which of the incisors is

usually suppressed; is it I_2 or I_3 ? Authorities differ, the majority agreeing that it is I_3 . This case appears to support Professor Turner's opinion that it is I_2 for this reason: I_2 is as large or larger than I_3 , while I_3 is about the usual size and shape of an ordinary lateral incisor. To support his view he refers to a large number of cleft palate cases accompanied by fissure through the alveolar border, and has found that usually a tooth is suppressed in these cases and that generally it is I_2 , I_3 persisting and being found approximating to the canine. He further considers that the alveolar suture is in the substance of one of the premaxillæ, and not at the suture between the maxilla and premaxilla situated just

at the position that I_2 would occupy. In this view he is supported by Dr. Albrecht. It appears very conclusive that in man it is I_2 that is suppressed, and that in this mouth it is I_2 that is the extra tooth, not I_3 .

CASES 3 and 4. IMPERFECT ARTICULATION.—Two cases during the year have been sent to the Dental Department in order that obturators might be made for cleft palate, and in each case on examination there was found to be no cleft. The arch in the first case was abnormally high, but in the second it was quite ordinary. Nevertheless, in both cases the articulation was of that peculiar nasal character that always accompanies fissure of hard or soft palate.

In the first case it was considered that the manner of speech might be due to the abnormal height of palate, and an artificial one was made with no good result. Some trouble was then taken to make the patient pronounce each syllable of a word separately and distinctly, and then slowly to repeat the whole word together. This was accomplished with several polysyllabic words, forcing the conclusion that the cause of the defect was that as a child he had been allowed to pronounce words in what parents fondly call "a childish way" instead of being made to enunciate properly, and that the habit had grown with the child until, when he presented himself at the hospital, he was seventeen. Satisfactory proof having been given that he could pronounce properly he was told to go home and break himself of the habit, and his mother was instructed to give him no food until he asked for it with perfect articulation. The boy was anxious to be cured, but found sixteen years' bad habit an exceedingly difficult thing to overcome. By dint, however, of hard practice and perseverance he almost entirely conquered the habit during the next six months, though directly he talked quickly or without circumspection he invariably reverted to the old manner of speech.

The second case was more difficult, as the patient had reached the age of twenty-five, and no amount of showing would convince him that he could do better if he pleased. He wanted something done in the "miracle way" that would cure him at once, and he would not take the trouble to cure himself. He would have been a good case for "faith healing."

CASE 5. ALVEOLAR ABSCESS.—E. G— came to the hospital with an enormously swollen face. The pus had infiltrated the whole of

the areolar tissue of the cheek, closing the eye, and spreading down into the neck. On looking into the mouth the fangs of the second lower molar were found to be the cause. These after some difficulty the patient allowed to be removed, a free flow of pus and permanent relief following. The difficulty the patient made was that his doctor had told him he must not have the tooth removed while the inflammation continued. It is to be hoped that this old error is exploded. An offending tooth should be removed, notwithstanding the inflammation, at once, and no amount of swelling should prevent this being done. This case is reported solely to call attention to this fact, difficulty so often arising at the hospital from the patient having been told *not* to have the tooth removed while the face is swollen.

COCAINE IN DENTISTRY.—This new drug, so useful in ophthalmic surgery, is not altogether useless in dentistry. Crystals of the citrate are perhaps the most useful, but a 50 per cent. solution of the alkaloid is very good.

Its main uses are as follows:

In extraction, if the drug is applied to the gums surrounding the tooth (the part having first been dried and protected from the saliva, or the cocaine will be washed away), the pain attending the adjustment of the forceps is obviated, but the wrench attending the fracture of the outer wall of the alveolus and rupture of vessels and nerves at the apical foramen is much the same. A small loose stump may be removed almost painlessly.

In cases of fractured teeth, where it is necessary to remove the pulp, cocaine is also useful. Applied to the surface of the exposed pulp it will deaden the sensibility, and if applied several times at short intervals the nerve extractor can be passed up the tooth, and the pulp extracted at once with very little pain. Cocaine is more effectual than anything else in these cases.

In cases of odontalgia, when the pain is due to exposed pulp caused by caries, it is not better than carbolic acid.

In cases of periodontitis, when the tooth is painful on percussion, and feels too long, it is useless; counter-irritation is much more effectual.

This drug is of distinct value in practice, and should be in every dentist's consulting-room.

PATIENTS' RECORD CHARTS.

SPECIALLY DESIGNED FOR USE IN DENTAL HOSPITALS.

By GEO. CUNNINGHAM, B.A.Cantab., D.M.D.Harv.

IN a paper read before the American Dental Society of Europe, in August, 1883, I attempted to develop a system of dental notation as a method of keeping records, and as a ready means of communicating a description of operations between members of the dental profession, and in the following year I communicated a few further notes on its application to professional book-keeping.*

Mr. Macleod, the Dean of the Edinburgh Dental School, had his attention called to this system of dental notation, and desired me to design a modification of the same for use in the Edinburgh Dental Hospital, which has since met with the entire approval of the dental committee of that institution, and which was presented at the December meeting of the Odontological Society.

On examining the various registers kept at the Edinburgh and both of the London Hospitals, I found that the only record kept is of the filling employed—for example, gold, amalgam, white cement, &c.—and, if I mistake not, even in America, where the private practitioner frequently employs some kind of detailed record of his operations, the practice has not yet extended to the dental hospitals.

As the present system necessitates the use of large and expensive registers, I saw at once the importance of designing something which would in no way interfere with the current system, and I now beg to present for consideration of the dental profession a Patient's Record Chart, which seems to meet these requirements. It consists of an entirely new and original diagrammatic sketch of the teeth, with appropriate spaces for filling in the name, address, and age of patient on the top of the card, while the body of the card is devoted to registering the dental operations under the columns respectively headed "Date, Number of the Tooth, Localisation, Dressing, &c., Filling, Rubber-dam, Time, Remarks, Operator," and two compartments respectively devoted to making records, where necessary, of (1) special history, and (2) memoranda as to results.

* Published by the Dental Manufacturing Company.

With regard to the design, I may say that, in compiling the before-mentioned suggested system of notation, I adopted Dr. Finley Thompson's chart, from motives of economy and as it was then the best extant. The design now presented to you has, I think, one or two distinct advantages. Firstly, it is printed in light blue ink, so that both black and red inks, and even pencil marks, show up clearly and distinctly; secondly, all the surfaces of each of the teeth are diagrammatically represented, so that the operation may be graphically represented; and, thirdly, the outline of the roots of the teeth are indicated for the purpose of facilitating a graphic representation of the filling of root canals. It is absolutely impossible in such a diagram to absolutely and accurately portray on one plane all the surfaces of the teeth. In all such tooth diagrams it is manifestly absurd to represent the cervical circumference of the tooth as being so much greater than the coronal circumference. But if we lay aside the "mathematical accuracy" view, we have a convenient, if conventional, projection which meets our practical requirements of representing the crown and all the sides of the tooth, despite the distortion of the angles formed; hence, doubtless, the uniformity in all existing diagrams of bicuspid and molars. The difficulties are much increased when we endeavour to make similar projections of the incisors and canines. After a careful examination of previous methods, a new plan is here presented which gives adequate representation to all the surfaces of these teeth, including the lower as well as the upper teeth. The disadvantage is having to represent a filling, as in the right upper lateral incisor (see illustration), by *two* marks, one on the mesial and the other on the palatal surface, to represent *one* filling. It is maintained, however, as our experience shows, that the disadvantage is more apparent than real. The turned down palatal surfaces in the present design serve as a guide to clearly indicate which is the palatal and which the labial surfaces of the bicuspid and molars. The size of the design has been advisedly increased to permit of approximal fillings being represented without the marks running into one confused blot. With regard to what may appear the arbitrary innovation of representing the roots of all the teeth, I am convinced that, from a clinical point of view, it is of the utmost importance to have some graphic representation of the extent of our operations in that direction, and that, from my experience of the records of those dentists

that are not good draughtsmen, such an outline will be of considerable service to many, as well as a saving of time to those more expert with the pen. The arrangement of the upper molar and the bicuspid roots requires explanation. In the present diagram the central root of the molars is the palatal, while the mesial and distal roots are respectively the anterior and posterior buccal, or labial, as we prefer to call them for the purposes of recording. In outlining the double canals in single-rooted teeth, as in the left upper bicuspid for instance, the mesial canal represents the labial or buccal, and the distal the palatal canal. In order to avoid confusion the method of numbering the teeth is the same as that employed by Dr. Finley Thompson, who begins numbering from the right upper third molar, and counting round to the same tooth of the left side, and then from the lower left third molar to the right side opposite where he begins. The graphic location of the different fillings should be indicated by employing red ink for gold fillings, black for amalgams, and a black outline for plastic fillings, while a convenient method of representing a combined stopping of a metal over a plastic filling material is by circling it with an outline in red or black, according as gold or amalgam is employed. Where it is found inconvenient to use red ink or a red pencil, it would be easy to represent the gold fillings by a black outline filled in with dots; though we strongly recommend the former method.

The following is the suggested method of using these cards:—A student, on receiving charge of a patient, after inscribing the name and address of the patient, will make an examination of the mouth, marking the cavities of decay in *pencil*, noting the special history, if any, and then as each operation is completed and filled in, the pencil mark is covered over with the appropriate ink, graphically indicating the extent and denoting the completion of the operation. At the finish of a series of operations the patient is advised to report himself periodically for the annual or semi-annual examination, and the record chart is deposited in its appropriate place until required for the next inspection of the teeth, when the results of past operations should be noted, and if any fresh operations required, recorded as before.

Every thoughtful dentist, who takes an interest in his patient's welfare, has experienced the disappointment of his patient failing to return at the proper time for the periodical examination of his

teeth. In completing a series of operations, I consider it an essential part of my professional duty to name a time, 3, 6 or 12 months hence, as the case may demand, when the patient should present himself; and I also offer to put his name on a list kept for the purpose, so that if he fails to report himself at the appointed time, within a week or so, he has a short correspondence card to inform him of the fact, and asking him to call to make the requisite appointment. Such a reminder is usually gratefully acknowledged by the patient, and such a method extended to the hospitals, by merely sending a printed form, would not entail much extra work on the staff, and would help to obviate a large number of interesting cases being lost sight of.

In this way our hospitals would have a greater educating effect, by creating a better appreciation of the benefits of dental surgery among the patients than they have at present, while it would also teach the dental student how much he can do to form a class of model patients whose aim will be the intelligent preservation of their own teeth, and how far our present methods of practice and the filling materials at our command succeed in fulfilling that object.

As it would be obviously a great advantage for the dental profession to have one recognised system of notation, and it is equally inadvisable to encourage each operator to create a kind of dental shorthand for himself, it is suggested that the plan of notation set forth in the before-mentioned communications be recommended for the recording of the operations on these record charts, especially as the system has already recommended itself to, and been adopted by, many members of our profession.

The objection has been raised by some who have examined the system that it contains too much and is too complex, whereas the observations of those who have already adopted it point to the necessity of its further elaboration. Where is the man who makes a complaint of his dictionary containing too many words? He need not use them all, but only such as meet his requirements. So it is with him who records his operations. In the Edinburgh Dental Hospital a number of cards containing a complete list of the symbols recommended are hung in the vicinity of the operating chairs, so that the student is not obliged to burden his memory by learning the symbols, but can at once ascertain the required symbol by reference to the alphabetically arranged list of operative and pharmacopeial terms. Even without the detailed notation

set out at full length, the upper part of the diagram gives a greater amount respecting information of the operations in an individual mouth than the present system affords.

With regard to the arrangement of the mass of the cards, it is suggested that they should be arranged upon what is termed the American Card Catalogue system, originally devised at the Library of the Harvard University, and adopted generally throughout the United States, and in this country at the Guildhall Library, at the Library of the Chemical Society in London, and also at Oxford University. The cards are placed in regular and *exact* alphabetical order in ordinary desk drawers or boxes designed for the purpose, so that they are loosely retained at an angle of about 35° to 40° , which enables the eye readily to catch the index letters on the top of the guide-slips, which may be inserted between every 20 or 30 cards. These guide-slips may be made of wood, zinc or strong cardboard of the same size as the card, with the exception that they are about three-eighths to half of an inch longer, for the imprinting of the letter or guide-word. Dr. Geo. L. Parmele, of Hartford, Conn., U.S.A., has employed a system of this kind for years, and which he strongly recommends. Mr. Harold Coffin has made an ingenious application of Amberg's directory system of indexing to this card system. It is an extremely complete method of indexing by which, instead of one uniform division for each letter of the alphabet, the sub-divisions of the alphabet are graduated to the requirements of the index, and resemble the abbreviations found on the pages of directories and dictionaries to facilitate reference. In private practice, with a case containing 1,000 cards, a division of the alphabet into 52 parts suffices, but in the case of an hospital with 5,000 cards in use, the division would be into over 250, and it is possible to get an index with 810 sub-divisions. The diagram representing the longitudinal section of a drawer or box based on one from Dr. Parmele's paper *Concerning Records in the New England Journal of Dentistry*, January, 1884, will explain the arrangement very clearly.

As shown by Dr. Parmele, a system of this kind can be utilised to tabulate the record of cases. The plan I suggest for such tabulating cards is as follows:—

PULPS CAPPED—Carbolised water applications.

DATE.	NAME.	AGE.	NO. TOOTH	CONDITION.	FILLING.	R.D.	RESULTS OBSERVED.
1885. April 8	Williams	21	15	e.b. T.	II F.se.	ρ	15 xii. 85. R.O.S. II. and found pulp protected by deposit of sec. dentine.

PULP CANALS—treated with Eucalyptus oil and Iodoform dressings.

DATE.	NAME.	AGE.	NO. TOOTH	CONDITION.	FILLING.	R.D.	RESULTS OBSERVED.
1884. March 19	Williams	21	18	a.n.c. inaccessible	A. Fr. 3.	ρ	
1885. March 2	"	"	12	2 n.c. (drill broken)	A. Fs.	ρ	4 III. 85 face swollen ap. 1 ppr. 12 III. 85 normal restored. (See special history)
March 25	"	"	9	n.c. open at apex	Ω + II. F.se.	ρ	

In my own practice, having worked a card system side by side with the recording ledger, I find that the strong cardboard slips meet the requirements fully, though the stronger and heavier zinc slips may be necessary to meet the rougher use of hospital work, where the records will have to be frequently referred to by many operators. The cost of such a system will not be great, averaging about three farthings or at most, including all the fittings, a penny per patient. The space occupied by the record charts will not be great, as a thousand cards with guide slips can be easily accommodated in comparatively little room.

I have found it more convenient, however, to make these tabulations in book form. Where it was desired to tabulate them, it would be easy for the student to enter each operation, such as the cappings of pulps by special methods, under the appropriate headings, and no system of Records can be complete without some such tabulations.

I cannot but think that, from the careful carrying out of such a system, results of considerable value may be attained—results benefiting not only the patient and the student, but also the profession at large. In this way we would be able to procure, in a relatively short time, an amount of experience of the actual behaviour in the mouth of various kinds of materials of different makers, and the efficiency of the various modes of capping pulps and the results of the treatment of pulpless teeth, which would be the work of a lifetime almost for a man to acquire in his own practice.

MR. F. A. BELLAMY, L.D.S.I., suggests the following expedient:—It may happen that those who employ the Hodge right-angle attachment may, peradventure, lack the exactly shaped bur most suitable for the cavity under treatment, and yet possess one or more of the desired form only belonging to the straight handpiece. Should time be of importance, under such circumstances, I select from my stock the one best adapted for my purpose, slightly nick the shaft with the corundum wheel the required length, firmly fix in the vice, and with a moderate tap with the hammer the bit breaks off clean at the mark. Thus, I have a short right-angle bur, to obtain which, in the usual way, would have necessitated waiting some hours, or, if residing in the country, days. In a few cases the rough broken end of the bur may require to be finished on the stone or wheel.

DEFECTIVE TEETH AND CATARACT.

AT a meeting, on November 6th, 1885, of the Academy of Medicine in Ireland, Mr. Story exhibited two patients with double zonular cataracts and teeth presenting marks due to arrest of development. A cast was shown of the similarly deformed teeth of another patient, who also possessed double zonular cataracts; and a fourth patient was present whose teeth exhibited the same defects, but who had had complete soft cataracts in both eyes. The history was given of another case, in which double zonular cataracts and arrested development of the teeth had been observed. Mr. Story alluded to the work done by Arlt, Horner, and Jonathan Hutchinson, and to the different theories proposed to explain the connection between zonular cataract and dental malformations. He drew attention to the close analogy between the development of the crystalline lens and that of a tooth, and said he believed any cause interfering with the growth of the lens or of a tooth might produce the peculiar zonular cataract in the one and the defects in the enamel of the other, which had been variously assigned to the action of convulsions, rickets, or mercury, by different authorities.

Dr. Bennett said, Were the teeth in question rickety teeth, because a great part of the communication depended on an alleged relation of zonular cataract to rickets? The teeth produced were supposed to be a connecting link; but he would not call them rickety teeth, because the sign of the rickety affection was reversed in them. He would be disposed to attribute the defect in the teeth produced to syphilis or mercury.

MATERIALS FOR FINISHING AND POLISHING FILLINGS.

By C. F. W. BODECKER, D.D.S., M.D.S.

From The Independent Practitioner.

THE best filling, unless great care has been exercised in finishing, may result in a failure, especially when situated upon the proximate surface of a tooth. With most of the appliances in use to-day, to obtain the desired result involves a great deal of patient labour. In dressing down gold fillings, small shellac corundum points are very serviceable, but, as soon as an instrument made of this material is small enough to reach all the depressions upon the

teeth, it readily wears out or breaks. For the proximate surfaces, sand, emery, corundum, &c., fastened upon paper, cloth, or celluloid, cut into strips or discs, have been employed, but with some difficulty, as the polishing materials are held upon the paper, &c., mostly by glue, and the cutting surface is destroyed as soon as it comes in contact with the saliva. Although an application of an alcoholic solution of shellac to the sand or emery paper will materially improve its durability, yet it remains a very disagreeable and sticky material to handle in the mouth, unless it can be kept perfectly dry.

Besides these, there are several other appliances, viz., Brown's polishing silver strips, copper strips, wood shavings, &c., but neither is free from objections. Not satisfied with these materials, and desirous of obtaining something better, Dr. William Herbst, of Bremen, Dr. Franz Berggren, and Dr. E. Förberg, of Stockholm, have largely experimented in this direction, and in certain appliances have made considerable improvements, which deserve the acknowledgment of the profession.

It is well known that points and discs, made of black rubber and corundum, or emery, have been used many years, but they cannot be obtained from the dental depots (as is understood), on account of a pending patent law-suit. But every dental practitioner may easily prepare them for himself, and better ones than can be bought at present. For this purpose take one part of ordinary red rubber, and two parts of corundum, or emery. Warm the rubber upon a water bath, and gradually knead the corundum or emery into it, so that it is evenly distributed throughout the rubber, which is then flattened out so that it may be readily cut. Take button moulds, or points made of wood, of the required size and shape, fasten them with wax upon the ends of worn out engine burs, insert them into an ordinary deep rubber flask, head upwards, in such a manner that the upper surfaces of the points are exposed, and pour the counter-part. When the plaster has set, open the flask, remove the points or button moulds from the mandrels, and after they have been cleaned perfectly with boiling water, pack a little ordinary red rubber in the centre around the mandrel, and fill the rest with the rubber impregnated with corundum or emery. Then close the flask, and vulcanize in the usual way. When the points are vulcanized they are, while rotating in the engine, shaped upon a coarse file, and then immersed in nitric acid from two to

six hours, according to their thickness. But precaution must be taken to apply a thin coating of wax all over the mandrel, else the acid will dissolve the steel. When hard rubber, corundum, or emery points are treated in this manner, the nitric acid dissolves the outer layer of the rubber, leaving the corundum or emery intact, thus exposing a cutting surface superior to the best ordinary corundum point, or sharp steel bur, and a great deal more durable than either. (Dr. William Herbst.)

Soft points and discs may be very easily made of ordinary vellum rubber impregnated with powdered pumice, but as the soft rubber cannot well be fastened upon a mandrel, a hard centre may be put into it in the following way:—With a punch cut the disc out of a sheet of vellum (soft) rubber, and out of this disc remove the centre by means of a smaller punch. The centre is replaced by a piece cut out of a sheet of unvulcanized hard rubber. The discs or points are then closely wrapped in tin foil, put in the flask, vulcanised, mounted, and trimmed upon coarse sandpaper, while rotating in the engine. (Dr. Berggren.)

To prepare discs that will withstand moisture, take a piece of strong, thin linen, and a piece of sand or emery paper. Varnish both with a rather thick solution of shellac in alcohol (the paper upon its sanded side), bring both together, and keep them under a press for three days. Then immerse in water, when the paper will be found to separate from the linen, leaving the sand or emery held by the shellac upon the linen, out of which the discs are stamped. (Dr. William Herbst.)

Durable paper discs, with emery or corundum, may be prepared by coating thin cardboard (without gloss), as postal cards, with a thick solution of shellac, and sprinkling the thinnest possible layer of corundum or emery upon it, out of which, when perfectly dry discs may be cut. (Dr. Förberg.)

To make discs of thin rubber cloth, to be used with advantage for polishing with powdered pumice or chalk, take two pieces of rubber cloth, as obtained in the rubber stores, coat them with a rather thick solution of shellac in alcohol, and immediately bring them together and keep them under a press for about two days. When thoroughly dry the sheet may be cut into discs by means of a punch, and when mounted upon a screw mandrel they can be made quite thin by holding them, while rotating in the engine, upon a piece of sandpaper. A variety of thicknesses of rubber

cloth may be employed with advantage, but it is better to cement two layers together, and then only use one thickness of rubber cloth, as the shellac imparts great stiffness to the disc. (Dr. William Herbst.)

For removing surplus filling materials from the proximal surfaces of teeth, a watch spring, upon which a layer of corundum or emery has been attached, is of great service. To prepare this, warm a thin watch spring over a Bunsen burner, or the flame of a spirit lamp, apply a thin coating of solid shellac, and quickly, while the shellac is yet in a fluid condition, immerse the spring into powdered corundum or emery. When perfectly cold they may be used in a saw frame, and will be found more serviceable than thin files. (Dr. Berggren.)

For polishing proximate surfaces of the teeth, ordinary rubber cloth cut into strips, or very narrow velvet braid, will be found to work admirably. Thin chamois leather will probably produce the finest polish, but when narrow strips are used they will stretch out, and tear very quickly. To overcome this difficulty, sew a seam lengthwise in the strip with a sewing machine, which will very materially strengthen it. (Dr. Berggren.)

To prepare tape which is very serviceable, and which will retain the polishing materials well, take some strong and thin linen tape, of desired breadth, soak in ordinary thin rubber cement for two or three days, then remove it, at the same time scraping off all the surplus rubber cement, and let it dry for about twenty-four hours. The tape is then impregnated by rubbing it with powdered corundum, pumice, chalk or any material that it is desired to use. The rubber cement will hold these substances very firmly in the meshes of the tape, and it may be used under water or saliva without losing its cutting surface. (Dr. William Herbst.)

THE DENTAL SECTION OF THE INTERNATIONAL MEDICAL CONGRESS, 1887.

AN influential meeting of Dentists in the United States was held on November 16th, to ascertain the feeling concerning the Dental Section of the Congress of 1877. There were present nineteen representative men, and Prof. Taft, President-elect of the section, occupied the chair.

Dr. W. C. Barrett proposed, and it was resolved: "That we

as members of the Dental profession, deem it inexpedient to recommend the organization of a Section of Dental and Oral Surgery in the International Medical Congress of 1877, under the present circumstances."

There was a general expression of opinion that the Dental profession had unwarrantably been insulted by the secretarial announcement that "The omission of the Section of Dental and Oral Surgery was judicious, dentistry not being generally recognised as a legitimate department of medicine." It was only when failure was imminent that they returned to dentistry and again invited it to come in. Communications had been received from Dr. Magitot and Sir James Paget, intimating the improbability of any one of note in either France, Germany, or England attending the Congress. Numerous letters were also read, the general tone of which being adverse to now forming a Section of Dental and Oral Surgery. The resolution submitted to the meeting was carried unanimously.

Commenting upon the question, *The Independent Practitioner* says: The dentists of the United States have watched with absorbing interest the various steps in the organization of the International Medical Congress of 1887. Remembering the signal success that attended the formation of the Section of Oral and Dental Surgery in the Congress of 1881, of which many of them were members, they were anxious that the dentists of America should have an opportunity to exhibit the progress that had here been made, and to demonstrate to the world the fact that legitimate dentistry was a science worthy the attention and encouragement of every other practitioner of the healing art. They received with great gratification the announcement that the next session of the Congress would be held in this country, and upon the formation of the Dental Section were ready to put forth every effort, and to secure for it, if possible, a yet more prosperous issue than had ever attended a convocation of dentists. They were prepared to accept the organization as announced, and had commenced preliminary work for securing a large attendance from this and other countries.

They understood that this was to be a World's Assembly of all that was truly representative in legitimate medicine, quite irrespective of society affiliations, or special vexed ethical questions. When, therefore, they became convinced, by the action of the American Medical Association at its meeting at New Orleans, that

a single society had usurped the supreme control of that which was intended to be a council in which the medical profession of the whole world could meet upon equal grounds, they began to fear that the success of their Section was seriously prejudiced.

Following this came the announcement that the Section of Dental and Oral Surgery was, by the reorganized committee, abolished, and that dentists would not be welcomed to the Congress, upon the ground that such medical men as had devoted their lives to the consideration of diseases of the oral cavity were not engaged in the legitimate practice of any branch of the healing art. This annunciation, by those in control of the organization of the Congress of 1887, after the distinguished success of the Dental Section of that of 1881, and the entire harmony that had marked all the deliberations of that meeting, and in view of the high scientific status which the practice of dental surgery and dental medicine had attained in this country, was the source of the greatest surprise to the dentists of America, nor are they now prepared to believe that a specialty that had met with full recognition by the profession of England, is considered by the intelligence of the medical men of the United States entirely illegitimate.

When, on account of defections from the ranks of the supporters of the organization of the Congress of 1887, it became evident that its scientific success was jeopardized, and the aid of the dentists was desired, without a word of apology or explanation the Section was re-established. But they fear that this action was prompted by motives of policy, and not from a real change in the convictions of the committee. Under such circumstances, we do not believe that a proper regard for our own dignity or that of our *confrères* in other countries permits us again to enter a meeting from which we have once been repulsed.

At the recent conference of leading dentists, called together by the action of Professor Taft, the President of the Section, there was a singular unanimity of sentiment concerning the duty of the dentists in this emergency. Professor Taft acted as chairman, and himself expressed no decided opinion. Dr. Allport, who has, from the inception of the scheme for a Dental Section, been especially active in its advancement, expressed the belief that success was within our reach, and that all differences would be healed; but we think we are correct in saying that not one of those present believed that any decided steps should be taken, under existing

circumstances, for the active organization of the Section. The most that was urged was that we should wait until the dissensions in the medical profession should be healed.

The resolution adopted provides for this. If the opposing medical factions unite, and the Congress promises to be something more than an enlarged session of the American Medical Association, we shall most heartily join with others in doing all possible to make the Dental Section one worthy the dentists of America. But we want no part in a rump Congress, and we have too high a regard for our calling to wish to see it take any part in a faction fight.

ODONTOLOGICAL SOCIETY.

At the November meeting, the following paper was read by WILLIAM HERN, M.R.C.S., L.D.S.Eng., on

A METHOD OF TREATMENT OF DEAD TEETH.

When I decided to make the treatment of dead teeth the subject of a short paper before you this evening, I was not ignorant that a great deal has been written and very much has been said already on the subject, for one has merely to refer to the dental journals of the past, Transatlantic as well as English, to find that the treatment of dead teeth has been a subject which has constantly exercised the minds and consciences of dental practitioners.

Some may, therefore, be inclined to consider it too threadbare and over-trodden to be worthy of further consideration. The fact, however, that so much attention has been directed to it in the past, coupled with the disagreeable present fact that scarcely a day passes with the busy practitioner without his being called upon to treat certain of these frequently occurring and troublesome members, shows it to be still a theme of considerable practical importance.

Seeing, then, the subject has such a practical bearing in its relation to us, as dental practitioners, I need not, I think, apologise for bringing it before you.

The method of treatment which I shall lay before you may differ but little, perhaps, in some of its details from that commonly practised by you, except, I imagine, in the *kind* of root-filling and the method of inserting it, so that I must ask for your leniency if

I travel now and then on well-known thoroughfares and refer to familiar manipulative details.

One of the first questions that we naturally put to ourselves is, "How can I most surely, expeditiously, and permanently save a dead tooth?" I think the answer to this question will be included in that of a second, viz., What is the cause, *par excellence*, by which dead teeth are lost to their possessors? This, I think, we shall all agree, is the result of inflammatory action, of a more or less severe character, of the peridental membrane originated and excited by the putrefactive changes of a dead pulp. I do not deny that a destructive periodontitis may originate from other causes, *e.g.*, by extension from other local inflammations, or even from constitutional states, but in the overwhelming majority of cases the suppurative periostitis, or abscess, which necessitates the loss of the tooth, is due to septic decomposition of the soft tissue of the pulp.

Granting, then, that this is the *origo mali*, our rational treatment, it seems to me, should comprise the total extirpation of the pulp, where practicable, substituting for the soft tissue a material which is not prone to decomposition but rather antagonistic to it; and, in those cases where the total extirpation of the pulp is impracticable, the same lines of treatment would indicate the application of certain antiseptics to prevent putrefactive changes in the small portions of pulp we have been compelled to leave *in situ*. I regard, however, a tooth treated by the latter method as one of which the prognosis is less hopeful than in the case of one treated by the former, and that the chances of success with a given tooth decrease in probability in the ratio of the increase of the quantity of soft tissue unavoidably left in the root canals.

We naturally divide dead teeth into two classes, as differing somewhat in their treatment—

I. Those which are devitalized by ourselves, and in which the pulps as a whole are not in a septic state.

II. Those which have died natural deaths and have subsequently undergone decomposition, so that the pulp canals are soaked with septic detritus.

The difference in the process of treatment of these two classes of teeth is, however, one of degree and not of kind, the latter requiring all the manipulation I am about to speak of as advisable for the former, together with a course of dressing to render them

aseptic, and to cure fistulous canals which they may have developed.

In both classes, however, I regard the following as three important axioms and principles of treatment :—

- I. The opening out of the crown of the tooth in a direct, or nearly direct, line with the long axis of the root.
- II. The enlargement or “funnelling out” of the orifices of the canals at their coronal ends, or openings into the common pulp chamber.
- III. The enlargement and opening up of each root canal throughout its whole length, if practicable, by means of flexible flame-headed drills.

I. The opening out of the crown may be accomplished either by enlarging the cavity of decay in the direction of the axis of the root, or, in cases where the carious cavity is situated altogether out of the direct line of the root or roots, by making a second opening through the crown. In incisors and canines with interstitial cavities the root canal can often be made freely accessible to our instruments by cutting the coronal third of the pulp cavity obliquely towards the cavity of decay. If the root canal cannot be reached and cleared in this way, it will be better to make a second small opening through the centre of the lingual surface of the crown.

In molars, similarly, with small deeply situated distal cavities it is frequently necessary to make a second opening through the crown in order to treat the root canals with any degree of thoroughness and safety.

II. The enlargement and “funnelling out” of the orifices of the canals at their coronal extremities is also an item of no small importance, giving, as it does, a clearer view of the canals and increased working space for their manipulation ; it also removes any secondary dentine which may be obstructing the orifices of the canals. A pointed fissure bur is one of the best instruments for performing this.

III. The enlargement and opening up of the root canals I regard as one of the most important aids to the successful and expeditious treatment of dead teeth. It results in at least a four-fold advantage :—

(a) By enlarging the calibre of the canals it enables the operator to remove more easily and surely the soft tissue contained in them.

This end is, moreover, greatly facilitated by the rotating action of the bur itself, for any lingering portions of dead pulp are effectually and rapidly removed by its twisting action.

(b) It enables the operator to introduce his antiseptic dressings with greater facility and better effect, inasmuch as they can be passed down to the terminations of the root canals, and so correct any septic influences there; this is all the more important when we consider that mischief always commences at the extremity of the root.

(c) It enables the operator with greater ease and surety to fill the root canals.

(d) It results in a considerable saving of time, both to patient and operator, for the cutting away and removal of the septic walls of the pulp canals in teeth, the pulps of which have undergone putrefaction, considerably reduces the number of dressings required for a given tooth; consequently visits are saved both to patient and operator.

This enlargement and opening out of the root canal is best performed by the engine, armed with flexible flame-headed drills, possessing rather a coarse spiral thread. The *Morey* and *Gates-Gliddon* drills are those best suited to this purpose—the pointed head of the drill guides the instrument along the canal and prevents any deviation from it, whilst the large spiral thread obviates clogging and returns all *débris*.

It is necessary to use these instruments with the greatest possible gentleness, allowing gentle persuasion to displace all force, working them with an alternate action of cutting and withdrawal; this prevents the burying of the head and consequent liability to fracture (at the neck of the instrument), at the same time that it brings out the *débris*. It is well before using the flexible drill, and occasionally during the use, to test the depth and direction of the root canal operated on with a blunt-pointed flexible broach.

The teeth are not all equally amenable to the process of treatment thus far described, and may, I think, be divided into two groups, in regard to the probable ease or difficulty of dealing with their root canals. Under the term *Easy* (or 1st group) I would include all the normally and commonly straight roots with single and approximately round or oval canals. Among these I place incisors, canines lower bicuspid, upper second bicuspid,

palatine roots of upper molars and posterior roots of lower molars, as those teeth or roots which can be manipulated with tolerable certainty.

Under the term *Difficult* (or second group) I would include those roots which are commonly more or less curved, and which contain small and laterally compressed pulp canals, together with those teeth in which the roots are neither constant in number, direction, or position. Among these I place anterior roots of lower molars, buccal roots of upper molars, first upper bicuspid, wisdom teeth, and abnormalities, as those teeth or roots which are most difficult of manipulation,—indeed in some, as I have before hinted, it is impossible, on account of the direction or position of the canals, to remove all the soft tissue,—consequently the probabilities of success in treatment are less strongly marked than with the former. In treating the anterior roots of lower molars we should not forget the very frequent and almost normal condition of a double canal.

With the canals opened and cleared as described, a recently devitalized tooth is ready for the root-filling. With septic roots, however, a course of dressing is first necessary to correct any lingering septic influences. The most reliable and efficient antiseptic for this purpose is, in my opinion and experience, iodoform, which can be used either dissolved in spirit or in conjunction with carbolic acid, glycerine, or eucalyptus, as a menstruum. I am at present unable to say whether mercuric perchloride will supersede iodoform as a root dressing, as I have not yet given it a sufficiently protracted trial to speak decidedly of its merits; it has, nevertheless, one prominent feature to its advantage in the absence of the pungent odour of iodoform, whilst it ranks very high as an antiseptic agent. I shall be glad, however, to know what are the experiences of other members of the Society on this point.

All putrefractive manifestations having been combated by antiseptic dressings, our next concern is to fill the roots. A root-stopping should, I imagine, possess a variety of qualities and characteristics; among others it should be—1, antiseptic; 2, non-irritating; 3, easy of introduction; 4, easy of removal; 5, capable of perfect adaptation to walls of canal; 6, soft and adaptable to a narrowing and deviating canal; 7, solid at the body temperature.

These characteristics and qualities are, I think, combined in a root-stopping composed of wax and iodoform, which is introduced into the root canal while warm by means of a wisp of cotton-wool on a broach.

The details of this process are as follows:—The root canals, having been previously prepared for stopping, should be dried and slightly warmed by means of hot air from a syringe. A wisp of cotton-wool of a suitable size for the root canal is next rolled on an angular broach (being careful to roll the wool tightly on the point to ensure the broach propelling and not piercing it). This being ready, a small piece of wax and iodoform may now be melted on a spatula, and whilst the wax is still hot dip the cotton wisp into it and immediately carry it to its place in the root canal by means of the broach, and press it into position with soft-tempered canal pluggers. Care should be exercised in melting the wax not to overheat it and decompose the iodoform. About half the length of the root canal should be filled with the wax and iodoform; the rest may be completed with gutta-percha.

Wax may be easily charged with iodoform by melting it to a plastic consistency on a warm slab and then thoroughly impregnating it with about half its bulk of precipitated iodoform with a stiff spatula.

Such, gentlemen, is the *rationale* of the process which, in my opinion, ensures the greatest amount of permanent success in the preservation of dead teeth, and I shall hope, as the subject is such a practical one, that a good discussion may ensue, so that we may have the benefit of your views on the subject.

I may say, in conclusion, I am not laying myself open to the charge of advocating an untried remedy, inasmuch as I have used it with the best results for over two years.

DISCUSSION.

The PRESIDENT said the question how best to preserve dead teeth in a useful condition was one which called for the best attention of every member of the profession. The more they studied conservative dentistry, and the more successful they became in the practice of it, the better they would please their patients, the majority of whom never applied for treatment till they were absolutely obliged, and then expected the dentist to make good the effects of their negligence. He should be glad to hear what those present had to say on the subject.

Mr. LATCHMORE said he could not agree with Mr. Hern in considering a mixture of iodoform and wax the best material for filling roots. He thought also that in Mr. Hern's method of introducing it, the broach with cotton wool round the point would be liable to act as a piston, and force *debris* through the apical foramen, where it would at once set up inflammation. In his opinion gold was a far better material to use. It was moderately easy to introduce, and also easy to extract.

Mr. ACKLAND said he had not used gold much for root-filling, but he had used the method described by Mr. Hern constantly for some time past, and had been very successful with it. He could fully endorse all that Mr. Hern had said in its favour.

Mr. HUMBY said the subject was one to which he had given a considerable amount of attention. He thought the wax and broach would act as a piston and force *debris* and air through the apex of the canal and thus set up fresh mischief. Mr. Hern had spoken of "dressings," but did not say how many were required. He found that he could treat such cases at one sitting. The essential points were to thoroughly get rid of the septic condition and remove all traces of moisture. His plan was to clean the canal carefully with cotton wool and spirits of wine, and then to inject cold air up the root for twenty minutes, until the tooth substances became white instead of slate-coloured; having thus got the canals thoroughly dry, he proceeded to insert a permanent filling. He did not know whether Mr. Hern claimed any originality for his use of wax as a root-filling, but he (Mr. Humby) had certainly seen melted paraffine recommended for this purpose, he thought by an American dentist, two or three years ago.

Mr. S. J. HUTCHINSON said he believed Mr. Charles Tomes had suggested the use of paraffine for root-filling in the *Journal* of the British Dental Association two or three years ago. He injected it into the canals by means of a hot syringe.

Mr. R. H. WOODHOUSE said he was very grateful to Mr. Hern for having prepared so good a paper at very short notice. He thought that most of Mr. Hern's observations and suggestions would be endorsed by those who had much experience of the operation referred to. For instance his statement that its success chiefly depended on the extent to which the root canals could be cleaned and filled was quite in accordance with ordinary experience. The palatine roots of upper molars, which were easily filled, as a

rule gave no trouble, whilst the buccal, which were not so easy, appeared also to require more treatment. He understood Mr. Hern to say that in certain cases he would cut away the crown of a molar for one-third of its extent in order to obtain better access to the root canals. He (Mr. Woodhouse) thought it was preferable to make a tap-hole in the centre of the crown; this did not impair the strength of the tooth, nor did it diminish its usefulness. The plan he usually adopted himself, after carefully cleaning the canals, was to pump in carbolic acid and phosphate of zinc, about 1 to 3, by means of a little cotton wool on a fine broach. He filled the canal with this for about half its extent, and the rest with gutta-percha, and had obtained very satisfactory results by this means. He supposed that Mr. Hern did not, as a rule, enlarge the canals except in the case of teeth with decomposed pulps.

Mr. HERN, in reply, said there could be no danger of foreign *debris* through the apical foramen, for he was always very careful to remove the whole of it, and get the canals quite clear before he attempted to fill them. As to the danger of forcing the wax through the foramen, he would suggest that Mr. Latchmore should try a few experiments with teeth out of the mouth. He would then find that it was impossible to get the wax to pass the foramen unless the tooth was hot and the wax quite molten. Under ordinary circumstances, although it was introduced hot, it became plastic before it arrived at the apex of the canal. As to air being driven out before the filling, he did not think that a small quantity of air impregnated with iodoform was likely to do much harm, and as a matter of fact no harm did result. It appeared to him that gold was of all materials the most difficult to use as a root-filling, and the most difficult to remove if this should be called for. If drilled out, the operator scarcely knew whether he was penetrating the gold or the side of the canal. In reply to Mr. Humby, he thought that iodoform was more to be depended on as an antiseptic in these cases than carbolic acid; its effects seemed to be more permanent. The time required for treatment depended entirely upon the character of the tooth and the nature of the case. Mr. Humby must take a long time over his own cases, if he always followed out the lengthy process he had described. He (Mr. Hern) had not found it necessary to be so very particular about removing the last traces of moisture. He did not remember to have seen Mr. Charles Tomes's paper on the use of paraffine for filling roots;

he himself had treated dead teeth in the way he had described since November, 1883.

The Society then adjourned.

The ordinary monthly meeting of the Odontological Society was held on December 7th, C. Spence Bate, Esq., F.R.S., President, in the Chair.

Mr. COTTRELL said that at the last meeting Mr. Arthur Underwood exhibited an upper molar with a sequestrum attached to it; in the following week he came across one very similar, taken from a child six months after it had had measles. The child's mouth was in a bad state at the time, but in a week after the removal of the sequestrum it was perfectly healthy.

Dr. W. ST. GEORGE ELLIOTT showed and described three little inventions which he had found useful, the first being an electrical indicator, exactly resembling a clock face, which had been very useful in recording the working of his battery and mallet, and which enabled him to control any number of cells, or test the working of one cell at a time. He then introduced to the notice of the Society a new handpiece, the merit of which, he said, was its simplicity, there being one catch in the centre which controls the bur. On simply depressing the catch the bur is released. The necessity of the pin to keep the bur from rotating, which is a feature in other handpieces, is obviated. He also showed a paper disc carrier, which, by increasing the length of the old-fashioned screw, so as to make the point a tangible one, the disc could be put on, and in a couple of turns be made quite fast. Dr. Elliott also exhibited two improved forms of syringe, which he had found very useful.

Dr. GEO. CUNNINGHAM presented to the Society for its consideration a patient's recording chart, designed for use at hospitals, which he had prepared at the desire of Mr. Bowman Macleod, of Edinburgh, whose attention had been called to the matter by Dr. Cunningham's pamphlet upon "Recording Operations." Dr. Cunningham described his system, urging the importance of having, if possible, one recognised system of recording operations at hospitals, and pointing out the value that such a system would have, both for the public and the profession, and especially the advantages that students would derive from a more exact record and the opportunity it would afford of marking their progress. (A full description is given at page 6.)

Mr. DENNANT said he had used similar cards for some time past, concurring with Dr. Cunningham as to the value of a systematic record, and expressing his indebtedness to that gentleman for his abbreviations, which he had adopted and found most useful. Mr. Dennant pointed out the benefit to both patient and practitioner that would follow from a dentist being able to forward a detailed record of his work and observations to a brother practitioner who might subsequently take up the case.

Mr. HENRI WEISS presented two models to the Museum, remarking that as time was getting on he would only briefly say that one was very extraordinary and interesting, and was believed to be only a congenital hypertrophy of the gum. The other was from a woman who had had a hard growth going on for six years, which was suggested to be only an extra bone growth.

Mr. C. SIMS described, by letter, an interesting case of dentigerous cyst in a boy ten years of age, who was brought to him with reference to a swelling of the lower jaw, which was painless. The boy had never had either temporary lateral or canine. Mr. Sims diagnosed it to be a dentigerous cyst, and laid it open. It contained no fluid, but forty-four small denticles were removed from it. He sent them for exhibition, together with a model of the tumour as it appeared before the operation.

Sir WILLIAM McCORMACK described a successful surgical operation that was necessitated by a distressing accident which occurred to a young woman while having some teeth extracted. He said seven or eight weeks ago a domestic servant, aged 24, was being operated upon under the influence of chloroform by Mr. Sanders, a dentist at Barnstaple, assisted by Mr. Jackson, a surgeon of the same town, for the removal of a number of diseased teeth, she being desirous of having a set of artificial teeth. The natural ones were many of them only represented by roots. After several of the teeth had been removed a pair of upper bicuspid tooth forceps were applied to the bicuspid tooth on the right side of the upper jaw. Mr. Sanders exercised three lateral movements outward and inward, depressing the forceps at the same time; he found himself unable to move the tooth, and in those movements the forceps slipped somehow on the crown of the tooth. Ultimately the forceps gave way, and the palatine blade broke. On immediately afterwards looking into the mouth it was found the tooth to which the forceps had been applied remained in its socket, while the

portion of the forceps had disappeared. The young woman immediately felt great pain and difficulty in breathing. Several attempts were made to relieve her at the time, but without success. She had some pain in the region of the sternum, spasms of coughing, causing pain, expectoration of bloody sputa, &c. Seven weeks afterwards communications were made for her admission to St. Thomas's Hospital. Immediately after her admission an examination was made, and it was found that there was a good deal of localised pain on the right side of the sternum, and this pain seemed to be travelling along the right lung; the left lung was free from pain. An examination was made by the stethoscope, and the position of the foreign body was indicated to be in the right bronchus. Sir William decided that, in the first place, as there was no chance of spontaneous relief, the only possibility of relief would be by performing tracheotomy, and trying to extract the portion of the forceps. The patient seemed to get worse, and during the night before the operation she had an attack of difficulty in breathing, and became very much distressed.

On the 26th of November she was brought into the operating theatre, and, by Mr. Tyrrell, put under the influence of chloroform. The neck was well thrown back, and Sir William made an incision into the trachea, dividing a rather large isthmus of the thyroid gland, around which was passed a double ligature. During the operation very little blood was lost. Passing a forceps into the left bronchus, it was distinctly felt to be empty; but on passing the forceps into the right bronchus the operator thought he felt a foreign body. However, not being quite sure, he passed a gunshot probe in, and then distinctly felt the blade of the forceps as far down as five inches from the lower end of the wound. After several attempts, the operator failing to get grip of the broken blade, the patient was well shaken and a wire loop was passed into the trachea, but without success. A urethral forceps was then tried, but with no better result. Finally, the forceps originally used were returned to, and, some silk thread having been wound round the fangs to prevent their slipping, then the broken blade was successfully removed. There was some trifling bleeding after the withdrawal of the forceps, but Sir William decided, notwithstanding this, to close the opening. The patient has made a very satisfactory recovery, and ten days after the operation the temperature was perfectly normal, and the pain and distress had quite disappeared.

In reply to the suggestion that the broken blade might have been removed, perhaps, by the introduction of a very powerful magnet into the incision, Sir WILLIAM McCORMACK said that the same idea had suggested itself to him, but he was not successful in his endeavour to get a magnet powerful enough.

Mr. S. F. EVE, F.R.C.S., Curator of the Museum of the Royal College of Surgeons of England, read a paper on the

PATHOLOGY OF CYSTIC AND ENCYSTED SOLID TUMOURS OF THE
JAWS."

The pathology of multilocular tumours seemed to him to have a more or less direct bearing on the specialty of the Dentist. This disease occurs at all periods of life, from infancy to old age. Its inception is insidious and its progress gradual. The patient notices a swelling in the alveolus; the swelling gradually increases, and the tooth overlying it becomes loosened and falls out. As its growth progresses the walls become thin, while in others they become absorbed. In the upper jaw the growth extends into the antrum. It was the mode of the generation of these tumours that he wished to invite their interest—viz., the mode of degeneration of the central cells of the enamel organ. Having sketched the earlier stages of tooth development, he went on to consider the way in which the stellate reticulum is produced, and held the view that its metamorphosis is the result of a form of liquefaction from colloid degeneration. He then pointed out the resemblance between the structure of a tumour and the rudimentary enamel organ, and concluded that these tumours were formed by the enamel organ of a suppressed tooth.

He then passed on to the second part of his subject—viz., encysted solid tumours of the jaws—and observed that clinically there is at times considerable difficulty in distinguishing such tumours from cystic tumours. He dealt with the varieties of tumours of the jaws, and considered the class of tumours known as embryo-plastic odontomata.

He proceeded to give two or three cases illustrative of his subject, and then compared and contrasted epithelial tumours and multilocular cysts, concluding by generally summing up the points in his paper.

In the discussion, Mr. C. S. Tomes made some observations, and the meeting adjourned.

TEETH.—A COMPLETE SET, £1 1s.

Single Tooth, 2s 6d. Five years' warranty. Dr. Andrew Wilson, Mem. Medical Council, says :—" I can recommend Mr. Goodman as a very skilful and humane dentist. His reasonable charges should attract to him all classes." Mr. GOODMAN, Surgeon Dentist (late Manager with Eskill's, London), 30A, Bold-st. Hours, 10 to 8.

A LIVERPOOL DENTIST AND HIS CLIENT.

AT the Liverpool County Court, on October 29th, before Mr. Collier, Judge, Richard Enon and Eliza Enon, his wife, sued Mr. Louis Henry Goodman, to recover £7 10s., amount paid for a set of teeth upon the defendant's guarantee for five years, and damages for breach of contract. Mr. H. F. Neale appeared for the plaintiffs, and Mr. Simms, of Manchester, for the defendant. Evidence was given that in November, 1884, the female plaintiff called on the defendant, who is a dentist at 30A, Bold Street, Liverpool, for advice concerning her teeth. He advised her to have several teeth out, and to obtain a set in place of them. She asked his price, and he undertook to make her a good set which he would guarantee for the price of £7 10s. She paid him £2 on account, and a few days afterwards called for and obtained the teeth, which he fitted to her mouth, and she then paid the balance of his charges, and received a written guarantee. Three days afterwards she noticed that one of the teeth was chipped, and she returned to defendant's surgery and made a complaint. She could not see him personally, although she called repeatedly. The tooth which was chipped ultimately broke off, and the top set hurt her mouth, and the gold strengtheners gave way. She returned the top set to defendant, who had since retained it, refusing either to return her the amount paid or make good the teeth. Mr. A. Kirkpatrick, dentist, was called, and, in reply to Mr. Neale, said the lower set of teeth produced were manufactured from vulcanite, and were of a most rubbishy description. The intrinsic value was *nil*. For £7 10s. a good set of teeth could be provided, but the set in question would never be of any use to plaintiff. Mr. Simms contended that the guarantee did not cover the question of value, and that the plaintiff had never made any complaint until some months after she had obtained the teeth, when defendant altered them at her request. After hearing further evidence, his Honour said there was clearly a breach of guarantee, and he therefore gave judgment for the plaintiff for £7 10s. with costs.

THE TRIBE FUND.

OWING to the lamentable death of Mr. Alfred Tribe, which was noticed in the December number of the DENTAL RECORD, his widow and four children have been left in somewhat straightened circumstances. An influential committee is being formed to raise a fund to provide for the necessities of the case. Dr. Hugo Müller, F.R.S., Pres. Chem. Soc., has been appointed Chairman; Dr. Gladstone, F.R.S., 17, Pembridge Square, W., Treasurer; and Dr. C. R. Alder-Wright, F.R.S., Chemical Laboratory, St. Mary's Hospital, W., Hon. Secretary. The Treasurer will be glad to receive subscriptions for this very deserving object; and there can be little doubt that a hearty response will be given to the appeal, as a recognition of the deceased's many services to chemical science.

TESTIMONIAL TO MR. OAKLEY COLES.

ON the 22nd ult. the friends of the National Dental Hospital and College presented Mr. Oakley Coles with a silver inkstand and pair of candlesticks. The presentation was made at his house by Mr. Alderman S. Lee Rymer, J.P. Engraved upon the tray was the following inscription:—"Presented to Mr. Oakley Coles by the Friends of the National Dental Hospital and College, in recognition of his many and valuable services to that Institution. This Testimonial was presented at the time of his retiring from the Dental Profession by forty-six Subscribers, 22nd December, 1885."

A number of his old friends and colleagues have formed a committee, consisting of Sir Edwin Saunders, Chairman; Mr. Charles Vasey, 5, Cavendish Place, Treasurer; H. Royes Bell, Edward Bellamy, Thomas Gaddes, Lord Alfred Paget, William Rose, Dr. Brodie Sewell, Henry Smith, and J. S. Turner. The object is to present Mr. Coles with a testimonial on his retirement from the Dental profession. Contributions should be forwarded to the Treasurer at once, as the fund must close very shortly.

NEW INVENTIONS.

PHILLIPS' SUCTION VALVE.

THE principle adopted in this valve is different from any hitherto used in connection with artificial dentures. It consists

of a disc of flexible india-rubber, concave on the palatine surface, and of the thickness of the denture. On the lingual surface it is held in position by a rim of gold or other metal. By the tip of the tongue pressing upon the disc its palatine surface is rendered less concave, which, on removal of the tongue pressure, regains its original form, and thus produces a vacuum.

The valve is illustrated in the advertising pages, where also is to be found a description of its application.

PULPINE.

Pulpine is introduced by M. A. Rosenthal, Liège, and is recommended for capping the tooth pulp. It is said to reduce inflammation and favour the formation of secondary denture. It consists of a fluid and a powder which are mixed at the time of use.

IMPROVED DENTAL BRACKET TABLE.

This is designed by Mr. C. J. Boyd Wallis, and made by the Dental Manufacturing Company. It was exhibited at the last meeting of the Odontological Society.

The table is somewhat on the Holmes pattern, but differs in general arrangement. The three drawers are made the entire length of the table, and open only from the front. The wing on the left of the table contains an arrangement for holding cotton wool, over which is a nickel-plated lattice-work covering, through which the wool can be drawn with one hand as desired; in this wing there are also partitions for bibulous paper and rubber-dam clamps. The wing on the right of the table is arranged for engine bits and discs. Between the upper surface and the top drawers is a drawer-tray which can be employed when many instruments are in use, and there is a corresponding drawer-tray at the back for carrying a spirit or other lamp. The top drawer on the left is arranged with a tray for carrying stopping instruments. On the table top, placed at the back, is a drawer surmounted by a box with a dust-proof lid, on the inside of which is a mirror for reflecting light upon the gold; the lid is removable, if required, by sliding hinges. The box is partitioned off into eight compartments for holding the various kinds of gold used by the operator. The drawer beneath is for the combined foil-carriers and pluggers, or other instruments as may be required.

The table is well made, and forms a handsome and useful piece of furniture for the dental surgery.

PROSECUTION UNDER THE DENTISTS' ACT.

JOHN WILLIAM BLAKE was summoned before the Sheffield Police Court on the 22nd ult. by the British Dental Association. He was charged with using the title "Dentist" in certain advertisements on his premises, he not being registered in the Dentists' Register. For the defence it was contended that Blake was a graduate (D.D.S.) of Philadelphia Dental College, and his diploma was produced; that he had never professed to be other than a graduate of that College, and had not represented himself as a dentist registered in England. The qualification of the Philadelphia Dental College is not recognised by the General Medical Council, and the Court held that the defendant had infringed the Act, and fined him £5 with costs.

OBITUARY.

WE regret to record the death, on the 30th ult., of FREDERICK WM. BATE, L.D.S.Eng. He had been for some time past suffering from rheumatic fever, to which he succumbed at the age of 26. Mr. Bate was a son of the late Mr. Henry Bate, M.R.C.S., &c., of Maida Vale. He served his articles with Mr. Felix Weiss, and having studied at the Middlesex and the National Dental Hospital, in 1882 obtained the Dental qualification of the R.C.S.Eng. He had also nearly completed the curriculum for the Membership of the College. He was for some time House Surgeon at the National Dental Hospital; and at the time of his lamented death was Secretary and Treasurer of the Students' Society.

The death is announced of JOHN M. RIGGS, D.D.S., at the age of 75. His name is well known in connection with the treatment of pyorrhœa alveolaris, a condition frequently spoken of as Riggs' disease. Dr. Riggs performed the first surgical operation under the influence of an anæsthetic, the patient being the late Dr. Horace Wells, whose name is so well known as the discoverer of modern anæsthesia in 1844. Dr. Riggs practised and died in Hartford, Conn., U.S.A.

MR. JOHN CALDCLEUGH, L.D.S.Eng., has been appointed to the Commission of Peace for the City of Durham.

JOURNALISTIC SUMMARY.**THE DENTAL COSMOS.** (*November, PHILADELPHIA.*)

"STUDIES OF THE PATHOLOGY OF ENAMEL OF HUMAN TEETH, WITH SPECIAL REFERENCE TO THE ETIOLOGY OF CARIES," by Frank Abbott, M.D. In this article, which was read before the American Dental Association, at Minneapolis, in August last, the writer says:—One of the most important questions in dentistry has always been the pathology and etiology of caries. Unquestionably, there are auxiliary agents in producing or fostering decay of teeth, such as certain kinds of food, more especially sweets, which are too often retained in the fissures always found in the grinding surfaces of certain teeth, upon irregular teeth, uneven surfaces of the enamel, etc. But he describes certain structural imperfections of enamel and dentine as predisposing to dental caries. Two cases are illustrated of protrusion of dentine into the enamel. One instance was that of a permanent cuspid, on the buccal surface of which, near the edge, a protrusion of dentine was observed, occupying nearly one-half of the breadth of the enamel. This protrusion was of a conical shape, and without a distinct boundary, but blended with an oblong field of enamel of quite remarkable structure. The dentinal canaliculi exhibited at their peripheral portions numerous bifurcations, and terminated in numerous small pear-shaped enlargements, many of which could be traced in connection with dentinal fibres, whereas the most peripheral ones, owing to their devious course, looked isolated. The adjacent enamel showed but very indistinct rods, the main mass of the enamel being occupied by brownish globular fields, separated from each other by irregular interstices closely resembling the interglobular spaces of dentine, though of considerably smaller size.

Particular attention is called to the fact that the dentine of this tooth was nowhere traversed by interglobular spaces; the anomalous construction being confined to the enamel. The stratification of enamel, or its incremental markings, are considered also deficient calcification of the enamel, without pigmentation, pimentation and granulation of enamel.

All clinicians have observed congenital white or yellow spots in the enamel of teeth, which if broken into are found to be of the consistence of chalk. Such spots have been termed "white decay,"

although they do not correspond to the process of caries as we usually understand it. They mean nothing but deficient calcification. Again, all clinicians have seen teeth across which a row of pit-holes exists, where in many instances in the bottom of the depressions no enamel is to be found. This condition is also always congenital, and closely related in its origin to pigmentation and the white or yellow spots. The *interprismatic* spaces of the enamel bear some resemblance to the interglobular spaces of the dentine. The nature of these spaces is plain enough. They mean an incomplete formation of the enamel, owing to some deficiency of function in the enamel-organ during its formation. Obviously not only the basis-substance is deficient, but also the amount of lime-salts is considerably less than normal; hence its brittleness and proneness to decay.

Having described a number of pathological conditions of the enamel, which, at least, so far as stratification, pigmentation, and granulation are concerned, mean a deficient formation of the basis-substance, together with decreased deposition of lime-salts, the writer concluded that these conditions are of the utmost importance in the etiology of caries. Ailments either of the mother during gestation or of the infant in the earliest periods of life obviously cause such anomalies in this tissue. These ailments are known to occur far more frequently in refined people, debilitated, as it were, by civilization, than in strong, hard-working, plain-living people, continually engaged in a struggle for life. Thus he directly demonstrates and anatomically shows, in a measure at least, the reasons why refined people are far more subject to caries of the teeth than people lacking such refinement.

“THE-ALVEOLO - DENTAL MEMBRANE: UNITY OR DUALITY—WHICH?” by L. C. INGERSOLL, D.D.S. This paper was read before the American Dental Association, at Minneapolis, in August last.

The early anatomists, regarding the teeth simply as bones, classed the membrane covering the *roots* of the teeth in common with the contiguous bone as belonging to the osseous system; hence they called it the *alveolar periosteum*. Not willing to ignore the teeth entirely as a part of the skeleton, when speaking of the teeth and their surroundings they called the same membrane the *dental periosteum*. In either case the use of the word *periosteum*

indicated that they understood that it held its chief relationship to the bone structure, like all periosteal tissue, and they had no distinctions to make between periosteal of different bones. If it belongs to the osseous system, it should be born with that system. If it belongs to the dental structure, it should be born in the dental follicle, and connate with the other dental issues.

Proceeding out from the base of the dental follicle is a line of cells encircling the neck of the tooth, destined to become the formative organ of the cementum, and immediately contiguous there is another encircling line of cells, originating in the surrounding embryonic bone, and destined to become the formative organ of the alveolar walls and the whole ridge of bone known as the alveolar ridge. For this purpose the osteoblast layer of cells develops downward to form the socket, while the cementoblast is also developing downward to form the cementum; and these two developments are contiguous to each other. Is the tissue now known as the dental periosteum, and also as the alveolar periosteum, a single or a double membrane? Has it unity, or duality, in its structure and relations? When a tooth is extracted from its socket the root is found covered with a membrane of soft tissue; and when the alveolus is examined the walls are also found to be covered with a membrane, which not only proves the duality of the root membrane, but that one may, by violence, be separated from the other. This can most distinctly be observed by the unaided eye in cases of chronic inflammation of this membrane. The writer further argues that there are two membranes arising from opposite directions, yet lying in immediate contact with each other, which become intimately united. This intimate union of the two does not, however, constitute them one membrane in any such sense that they lose their duality. For the *more* intimate union of the membrane with the cementum does not constitute these two tissues one; nor does the like intimate union of the periosteal membrane with the bone constitute both one. They are still distinct and separable.

Having given his views upon its structure and functions he, in conclusion, sums up as follows:—

1. We have found that the alveolo-dental membrane is not identical with periosteum. It is like periosteum in that it exists in two layers; but in case of the root membrane they are *separable* layers, as demonstrated in tooth extraction. Periosteum has

layer of straight parallel fibres like the layer next to the cementum.

2. We have found that the two layers have not the same origin,—the one originating in the osseous system; the other originating in the dental follicle.

3. We have found that they differ in their structure—that the layer next to the cementum, after the parting of the fibres into a fine reticulum for the accommodation of the cementoblasts, are conspicuously blended into a band of nearly straight parallel fibres, pursuing an oblique direction until they reach the central portion, or the line of contact with the other layer, and here they are brought by a gentle curve into a line parallel with the outermost and innermost surfaces of the membrane; that by this loss of their obliquity we lose the evidence of their continuance through to the other side of the membrane and their union to the walls of the alveolus; that the membrane next to the walls of the alveolus conforms in its structure to that of ordinary periosteum; that they have strongly-marked histological differences.

4. We have found that they have different functions—one being the organ of formation of the bone constituting the socket, and the other forming the cementum, and it is claimed by no reliable authority that these two tissues are identical; that the most that can be said is, that the cementoblast cell is a modified osteoblast.

5. We have found that they have different sources of nerve and vascular supplies—that as nerves and blood-vessels have never been traced passing through from side to side, it is a case of the highest probability that the *different* sources of vascular and nerve supplies from opposite directions is a physiological necessity, because of the dual character of the membrane.

6. We have found that pathology points to the same facts,—that the difference in their susceptibility to diseased action, as in cases of cementosis (no cementitious union ever being formed between the root of the tooth and the bone of the socket), proves that the membranes covering these hard tissues respectively *are not under the control of the same nerves*, and are not supplied by the same blood-vessels.

7. We have found that the rapid and almost universal healing by absorption, without exfoliation, of the alveolar processes after the wound of extraction, gives the strongest possible evidence that the alveolar socket is lined with a membrane *after* the operation,

which, with the membrane covering the root, amounts to demonstration of the duality of the alveolo-dental membrane.

Thus, surgery, pathology, and physiology are found in harmony with each other, demonstrating the same fact.

In this examination of the nature of the alveolo-dental membrane I make no claim to original investigation; I am not a microscopist; I have made use of others' eyes and of others' microscopes, and have trusted to what they have revealed. I offer the advantage of the same eyes and the same microscopes to you, and ask you what you see,—unity, or duality?

“DENTAL CARIES.”—By A. Morsman, M.D., D.D.S. This portion of the article deals with errors of environment as predisponents; and under this heading he considers those detrimental influences surrounding the teeth, external to them, and compatible with a normal systemic condition.

“THE CATARRHAL NATURE OF PYORRHEA ALVEOLARIS.”—By J. D. Patterson, D.D.S. The especial object of this paper, which was read before the American Dental Association at Minneapolis, is to present the study of the comparative pathology of pyorrhea alveolaris and catarrh.

The similarity of pathology in these two complaints is set forth in the following particulars:—1st. The similar appearance of the affected mucous membrane in both diseases, and in the various stages of each. 2nd. The identical character of the effusions. First, serous, containing numerous epithelial scales; then becoming filled with pus-corpuscles and blood-corpuscles. 3rd. The infectious nature of both diseases. Text-books all agree that catarrh is not only contagious, but sometimes even epidemic. The contagious nature of pyorrhea alveolaris is well known to careful observers. From the gum or one or two teeth it rapidly contaminates the neighbouring parts until the mucous membrane around each tooth is affected. 4th. The burrowing of pus, similar in each trouble. 5th. The tendency to destruction of periosteum and the underlying bone. 6th. The similar deposits thrown down in both diseases. It is scarcely necessary to again call attention to the fact of deposit accompanying pyorrhea alveolaris. It is so well known and so frequently encountered that all are familiar with it. It is not, however, generally known that accompanying catarrh there is also a deposit, thus forming a strong point of

similarity in pathology with the other disease. In the volume of Ziemssen, before referred to, we find the following upon the complications of catarrh:—"The fluids retained may throw down chalky deposits, and thus form bony concretion." * * *

'These deposits are of variable hardness, and usually consist chiefly of phosphate and carbonate of lime. The mucous membrane of cavities contiguous to the nose, particularly of the sphenoid bone, is especially liable to this change, but the membrane covering the turbinated bones may, too, be affected, developing, first, fine granular points, and afterwards plates of calcareous matter."

The character of these deposits, and the manifestations of disease preceding their formation, point strongly to the conclusion that they are similar in origin to the deposits which are found in pyorrhea alveolaris.

THE INDEPENDENT PRACTITIONER. (*December, NEW YORK.*)

"SEQUELÆ OF CARIES OF TEETH." This was the subject of a paper read at the Annual Meeting of the American Dental Society of Europe, in August last, by Dr. Gottinger. The sequelæ produced by caries of the teeth may be conveniently considered under three categories, as produced:—

First, by proximity of structure.

Second, by reflex nervous action.

Third, by communication through the circulatory system. Disorders of the teeth may be transmitted to all the structures of adjacent parts with which they entertain relations, either of continuity or contiguity.

The first and most frequent involvement in disorders of teeth is probably that of the saliva, and recollecting the important function of saliva in digestion, we will readily appreciate the importance of its integrity and the mischief produced by its morbid alteration. Besides, the saliva reabsorbed by the blood will impart its own taint to it. The air entering the respiratory tract also undergoes certain changes when the teeth are diseased. However slight such an alteration may be during a single inspiratory act, the effect must become cumulative by the frequency of those acts.

Next in order to be affected are manifestly the gums, due to their intimate anatomical connections. That even the tongue cannot retain its normality during the periods of dental disorders

seems likewise quite natural. It may be said briefly that all the surrounding mucous structures suffer more or less, the epithelial cells and mucous glands probably being first attacked. Even comparatively remote structures, such as the laryngeal or digestive tract, may be affected. In this case, the involvement is said to take place by contiguity of the mucous membrane. The circulatory system also forms an important and dangerous channel for the communication of affections of the teeth.

Sequelæ of altered teeth, transmitted by nervous influences, is illustrated in the fur of the tongue. Although often produced by an altered condition of the blood in febrile affections, or by local affections of the mucous membrane, it does not infrequently result from the presence of diseased teeth. The peculiar furry condition of the tongue in case of decayed molars, mostly unilateral, on the side of the affected molar, seems to be produced, less by the contiguity of the structures than by reflex action, involving primarily the second and third division of the trifacial nerve, this nerve presiding over nutrition and repair of the parts. That it is really a reflex action appears from the fact that the same furry condition of the tongue is produced occasionally by intracranial disease, or by fracture of the base of the skull. But another explanation of unilateral fur in presence of a diseased tooth seems equally plausible, namely, that the half of the jaw containing the diseased tooth is far less used in mastication than the other, and hence no removal of the epithelium of one half of the tongue takes place by friction of the food. In this case the nervous connection relates to the glosso-pharyngeal nerve, which is distributed to the tongue. A more curious instance of nervous transmission from the teeth is the appearance of gray hair on the temple, dependent on a decayed molar on the same side. In this case the auriculo-temporal branch of the third division of the trifacial probably caused the stated affection.

Even the ear may, by reflex action, become the seat of disorders when the teeth are affected. Dr. Addison, of London, applied to the most eminent specialists of the ear for treatment for an ulceration of the auditory canal. The remedies given failed to benefit him; but an extraction of a diseased molar in the lower jaw on the same side proved a quick and complete relief.

CORRESPONDENCE.*To the Editor of the DENTAL RECORD.*

SIR,—A copy of a small work published by C. H. Lord, of Detroit, has just come into my hands, and, to my surprise, I find that nearly one-half is reprinted from my "Practical Hints for the Laboratory and Operating Room," first published in 1873. I would suggest to Dr. Lord that, in the event of the Dental profession requiring another edition of his compilation he should add to the title, "An Appropriation of another Writer's Book, by C. H. Lord." To say nothing of the morality of this kind of thing, one would think that common politeness would have suggested the propriety of acknowledging his indebtedness to another for so large a proportion of his matter ; but, as my little book is pretty well known, both in England and America, I am inclined to think this proceeding on the part of Dr. Lord will not add to his reputation.

THOS. FLETCHER, F.C.S.

Editorial.

A TEACHING UNIVERSITY.

THE subject of establishing a Teaching University in London has been for some time past, and still is, engaging the attention of many important authorities and eminent individuals in the southern half of England. The medical aspect of the existing grievance is that Students of the eleven metropolitan and of several of the provincial schools can obtain from the Royal College of Physicians of London and the Royal College of Surgeons of England only a form of associateship — Licentiate, Member, or Fellow — of either corporation, whereas the Scottish students, for practically the same curriculum and examinations, can be granted from their *alma mater* a University degree—M.B., C.M., or M.D. Of course, there are the Universities of London, Oxford, Cambridge, Durham, and Manchester, but they do not meet the circumstances of the case. The London University stands alone in not being a teaching body ; its functions are purely examining. Its examinations are the most difficult, and its degrees pre-eminent—beyond the reach of the ordinary Student of either

Medicine, Science, Arts, Literature, or Laws. The other Universities are teaching institutions, and require residence as a necessary antecedent to graduation.

It is the general desire of the movers in this scheme to form a University that will be a teaching body, that will recognise the existing Medical Schools as affiliated colleges, and grant Medical degrees on similar terms to the Scottish institutions. Early in December last the Council of the Royal College of Surgeons of England passed the following resolution :—

“ That it be referred to a committee to consider and report to the Council whether it be desirable that persons who have become qualified under the conjoint examination of the Royal College of Physicians of London and the Royal College of Surgeons of England should, after an additional re-examination, have conferred upon them, either by the two Colleges, *or by a graduating body in London of which the two Colleges shall form an essential part*, a degree in Medicine and (subject to further consideration and ultimate approval by the Council) a degree in Surgery also.”

That is one aspect of the subject.

The proposal with regard to the Incorporated Law Society and other functions ultra medical, need not be referred to here. But our present object is to urge the consideration of the question—

Can the interests of the Dental Profession be advanced by Dental education and examination being embraced by the University now proposed to establish ?

Prominence is given to the question, and, without supplying a definite answer, some thoughts may be adduced in connection therewith. The formation of a University having powers such as are here briefly sketched would be a boon, and offer advantages and higher status to the great mass of English Students of Medicine and Surgery who now, under the incidence of existing circumstances, become candidates for and obtain only

the titles or qualifications of the Royal College of Physicians and of Surgeons. As it is claimed that a University Degree would carry with it benefits to the Students, the Practitioners, and the Profession of Medicine and of Surgery, is it not reasonable to suppose that Dentists and the Dental Profession would likewise be benefited if embraced by the scheme? What is good for two members of a family will, *cæteris paribus*, be good for a third member. The practice of Medicine, Surgery, and Dentistry are three distinct sections of the parent science—MEDICINE. As there are higher qualifications and degrees in Medicine and in Surgery, so may there not be a higher degree in Dentistry? Should a Dental Degree of the University be in Dentistry purely and simply, like the existing license; or should it, in virtue of a fuller curriculum and higher examination, be a degree conferring rights to registration in the Medical as well as in the Dentists' Register? Much more might be said upon the question, but perhaps we have now written sufficient to arouse the profession to recognise the great importance of the subject; and if any action is to be taken, some representatives should at once be sent to the Association for Promoting a Teaching University in London.

THE DECAY OF THE TEETH.

OUR contemporary, *The Lancet*, has, of recent years, spoken of the specialty of Dentistry with increasing patronage. For every mercy we are thankful. Just as there is an antithesis to the philosophic axiom "a soul of goodness in things evil," so in our excellent contemporary is there occasionally to be found a trace of error in its great soul of truth. We do not at all times venture to comment upon its observations on dental matters, but that does not imply the want of opportunity. To the observations upon the quotations from John Hunter, reproduced "for contemporary guidance," the nature of the case supplies a rejoinder. "That decay of the teeth is a malady which ought to be regarded as falling within the province of the medical practitioner" is a statement to which, perhaps, little exception could be taken, if the "medical practitioner"

were of sufficient giant capacity to embrace and practise with intellectual and manipulative ability all the phases of the Science and Art of MEDICINE. But there is here an outcropping of the old denunciation of specialties, and perhaps in a little time even this milder form of it may become assimilated with a well-established and recognised necessity for the present practice of Dentistry.

The very startling statement is made that, as a tendency to cause teeth to decay, "the old-fashioned notion about eating sugar and acids and the like is exploded." This announcement is directly contrary to all the recent and important investigations and conclusions upon the causes of dental caries. Magitot says, "Among injurious alimentary substances, sugar, under all its forms, should be placed first on the list." . . . "We should also attribute, without doubt, the caries of certain domestic animals, the dog and cat, for instance, to the use of sugar." Wedl is translated as writing that "An enumeration has been made of the articles of diet which are said to tend to increase the frequency of caries, such as fruit, food which has become sour, curdled milk; but sugar is regarded as the most injurious." Leber and Rottenstein observe, "No one at this day can refuse to believe in the necessity of the action of acids to occasion caries of the teeth;" also, "as for the action of sugar, all experiments result in showing that in its normal state it never attacks the teeth; it only acts on passing into the state of acid fermentation," which quickly ensues in the mouth. Messrs. J. and C. S. Tomes write—"We may fairly come to the conclusion that sugar itself has no power of acting upon the teeth, but that the various fermentation-products which are derived from it are exceedingly potent for evil." . . . "That it (caries) is due to the solvent action of acids which have been generated by fermentation going on in the mouth." We venture to think it may be worth while to reproduce this array of facts and "opinions for contemporary guidance," so that at least *The Lancet* may learn from what it pleases to designate as "that contemporary generation which has been so beneficially provided with newer and better light and leading."

We are sure of the unanimous opinion of the Dental Profession in favour of this recommendation to medical practitioners, viz., that in prescribing acid medicines to be taken by the mouth, an alkaline or neutralising mouth wash should also be enjoined as a prophylactic measure.

ANNOTATIONS.

BROKEN FORCEPS.

THE unfortunate accident which happened in the practice of Mr. J. J. H. Sanders, L.D.S.I., is one of considerable interest. Mr. Salter enumerates fifteen forms of casualty that may arise in the operations of tooth extraction, but he does not mention the breaking of the instrument and the fractured portion lodging in the air passage. The form of accident which occurred to Mr. Sanders' patient (see page 28) is unique. We have been informed of two cases of death occurring in the practice of one individual. It was the unfortunate experience of an American Dental practitioner to twice have an extracted tooth fall into one of the bronchi, and in each case eventually cause the death of the patient. There was an interval of some years between these two incidents, but the second case so weighed upon the mind of the operator that he himself shortly afterwards died.

Notwithstanding the after-operation of tracheotomy, the successful removal of the foreign body, and the recovery of the patient, Mr. Sanders is to be commiserated and sympathised with. At the same time he is congratulated that the life of the patient has been retained, and the fatal issue, as in the two cases mentioned, averted.

GOSSIP.

Mr. ALFRED COLEMAN has evidently won the high esteem of the general public in his new antipodean home. He has been giving a course of ambulance at Nelson, New Zealand, and the newspaper reports eulogise Mr. Coleman on the great interest his lectures created, and the successful manner in which he treated

his subjects. "Possessed of a considerable fund of dry humour, the doctor contrived to keep up the interest from first to last, and an occasional well-timed joke did much towards impressing on his hearers the particular item with which he was for the moment dealing." The numerous and valuable services Mr. Coleman has given to our profession in England, and indeed to the world at large, are not being forgot. Testimony to that fact will be received with general satisfaction, and especially the proposal of the Representative Board of the British Dental Association to recommend him for election as an honorary Fellow. This is the first instance of such a proposal.

At the ordinary general meeting of the Edinburgh Dental Students' Society, held on December 7th, Mr. G. W. Watson read a paper entitled "Notes on Dental Materia Medica and Therapeutics," and Mr. Edwin A. Cormack, the President, also read a paper upon "The Administration of Anæsthetics."

THE Edinburgh Dental Students held their first smoking concert on Friday evening, November 20th. There were nearly 100 gentlemen present. Mr. Edwin A. Cormack presided, supported on either side by Mr. W. B. Macleod and Mr. A. Wilson. The programme gone through was a varied and attractive one, and in every respect the event was very successful.

At a recent meeting of the Midland Medical Society, Dr. Suckling showed a man, aged twenty-six, suffering from facial paralysis with inequality of soft palate and deflection of the uvula. Two years ago he was thrown out of a trap on to his head. Purulent discharge followed from both ears some weeks later, ending in absolute deafness and facial paralysis on the right side. The faradaic and galvanic irritability were quite lost; the uvula was deflected to the right, and the posterior pillar of the fauces on the left side was much narrower than on the right. Dr. Suckling considered the palatal changes to be interesting, since Dr. Gowers says he has never seen the soft palate affected in facial paralysis.

A PATIENT from whom the whole tongue and anterior portion of the lower jaw had been removed for epithelioma was shown at a recent meeting of the Clinical Society. But little deformity resulted.

A SOLDIER was wounded in the neck at the battle of Alma, and an unsuccessful attempt was made to remove the bullet. The wound, however, healed, and the patient served through the remainder of the campaign. Since leaving the army he has worked as a shoemaker, and has often been inconvenienced by the presence of the foreign body. This Russian bullet has recently been removed at the Royal Infirmary, Edinburgh, after having lodged in the neck for thirty years.

MONTHLY STATEMENT of operations performed at the two Dental Hospitals in London and the Birmingham Dental Hospital, from November 1st to November 30th, 1885:—

	National.	London.	Birmingham
Number of Patients attended ...	1,687	2,261	805
Extractions { Children under 14 ...	404	324	564
Adults ...	476	814	
Under Nitrous Oxide	520	599	
Gold Stoppings ...	105	273	—
Other Stoppings ...	640	771	241
Advice and Scaling ...	448	132	—
Irregularities of the Teeth ...	366	128	—
Miscellaneous ...	135	267	28
Total...	3,094	3,308	846

ANSWERS TO CORRESPONDENTS.

ANXIOUS ENQUIRER.—There are only two American Dental Degrees recognised by the General Medical Council, viz.:—D.M.D. Harvard, and D.D.S. Michigan. No other American degree entitles the holder to registration or to practise in the United Kingdom.

PUPIL.—The question is one that can only be decided by the Medical Council.

ASPIRANT.—The Membership of the Odontological Society is regarded as evidence of professional respectability.

THE DENTAL RECORD.

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No. 2.

ROOT FILLING WITH WAX, &c.

By W. GRAYSTON, L.D.S.I.

WAX as a material for filling pulp canals has been used by some dentists for quite a number of years, the method being to melt together wax and carbolic acid, and when cold to roll into fine points between the thumb and forefinger. The point is introduced into the root and pushed up with a ball of cotton wool. When the wax reaches the apex the pressure of the forced-out air causes pain, and the patient is requested to give notice of this.

Canals should be permanently filled as soon as they and the surrounding parts have been brought into a fit condition. Should trouble occur in the future, treatment through the alveolus will give the best results.

When the canals cannot be thoroughly cleansed, the use of iodoform paste, lime paste, tannin and carbolic acid paste, &c., worked as far into the canals as possible, and left there, will generally give most satisfactory results.

A permanent root-filling should prevent exudation of moisture into the canal through the apex, or from the tubuli, and this is all that is necessary.

Plastics, such as oxychloride of zinc, gutta-percha, wax, gutta-percha and chloroform, wax and chloroform, sandarach varnish, &c., will all give good results. The best material is that which can be most effectively introduced in the case that presents itself.

These plastics are generally incorporated with shreds, or fine parts of cotton wool. Fine crystals of gold or platinum will be useful in many cases. Cotton wool is wrapped round these crystals, which are then dipped in the plastic selected, pushed into the root, and left there;—the projecting part is cut or broken off. Success in these cases is mainly due to manipulation and careful treatment previous to the filling.

Respecting the relative proportions of iodoform paste and carbolic acid or creosote, I have always found that if cotton wool, saturated with either of the latter, was introduced into a canal and removed after three or four days, the wool came away quite white, and all traces of the antiseptic had disappeared. I have removed wool that has been saturated with iodoform paste, and have found it become dry; but that is the only apparent change, even after it has been in a root for six months.

SUPERNUMERARY TOOTH.

By CHARLES F. FORSHAW, D.D.S.,

Late Dental Surgeon to the Bradford Children's Hospital.

A GENTLEMAN, æt. 62, a patient of Mr. W. L. Roberts, M.R.C.S., Honorary Surgeon to the Bradford Infirmary, came for advice regarding his mouth. He had a complete upper natural denture, but thought that he would like to have the *Dens sapientia* extracted, as between it and the malar bone, on the left side, was what he thought a foreign body. He had felt it there for four or five months, not painful, but very annoying, and surmised it was a splinter of bone which had probably got between the teeth whilst eating. On careful examination I found it to be a supernumerary tooth, about $\frac{1}{16}$ part of an inch through the gum; and, on my recommendation, he had it extracted. On measuring I found it $\frac{3}{8}$ of an inch long, and of a conical shape. I have frequently had cases of third dentition, but never before where the patient had a complete set. I should like to hear if any readers of the RECORD have had a similar case.

THE TREATMENT OF A CASE OF IRREGULARITY.

(A paper read before the Midland Odontological Society in Nov. last.)

By J. S. CRAPPER, D.D.S., L.D.S.I.

MR. PRESIDENT AND GENTLEMEN,—You will, I think, agree with me that any peculiar cases we may meet with in practice will be found interesting and instructive to introduce at our meetings, and being inspired by this feeling has induced me to submit for your inspection the models now before you, representing the mouth of a young man, who is now present, in order that you may have

an opportunity of investigating the case. No. 1 model (illustrated by fig. 1) is that which I obtained two years ago when he first consulted me, and No. 2 model (fig. 2) is that which I obtained on Tuesday last, when he kindly consented to accompany me to this meeting. In comparing the two models, you will see that the second molar right and the first molar left have been extracted, the wisdom tooth on the right having taken the place of the second molar, and the second molar left has come forward filling up the space formerly occupied by the first molar, and the wisdom tooth now occupies the position of the second molar left. You will see also that the lateral, in addition to the two supernumerary teeth, was removed, making in all six teeth which I removed under the influence of the nitrous oxide gas. What I consider extraordinary

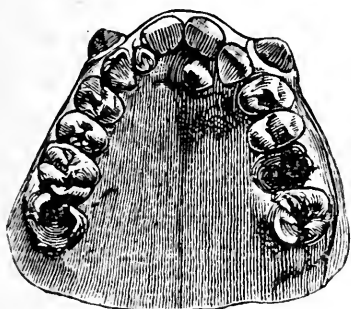


Fig. 1.

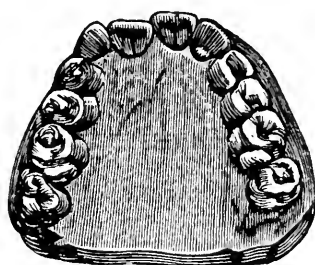


Fig. 2.

is the remarkable change which has taken place after the removal of the teeth named without any artificial assistance. No doubt if a regulation plate had been constructed the whole arch would have been much improved, and the pushing in of the right central by the canine would have been easily prevented, but that irregularity can be corrected by wearing a small piece I have constructed for the purpose. It is only proper that I should explain that this young man did not give me a fair chance of making the restoration and improvement I wished, as his occupation in life prevented his coming to see me; in fact, I did not see him more than twice during the first year, and it was within that time the great change and improvement in his personal appearance took place. Repulsive as his expression was when I was first consulted, it was with him more the desire to be relieved of the excruciating pain he was then suffering from than any anticipation of having his appearance and general health so much benefited. You will observe he has erupted the full set of sixteen teeth in the upper jaw, and now No. 2 model shows he has only twelve, six in each half in place of eight, and

yet he has as many teeth as the size of the jaw will admit. I have exhibited models of this case to several of my professional brethren who, owing in a great measure to the No. 2 model not being so perfect in showing the peculiar cusps of the molars, were disposed to think I might have mistaken the models, and one gentleman went so far as to suggest that I had removed the left canine instead of the lateral; however, he subsequently altered his opinion, but not as to his view of the model showing the cusps of the molar teeth, but, in order to prevent any further misapprehension, I decided to bring my patient before this meeting. One especial point I call attention to is the fortunate juncture at which I was first consulted, viz., at the time when the wisdom teeth were developing; although it would have been preferable to have been able to give earlier attention, yet further delay would have been very injurious. In examination of his mouth, you will observe that his teeth are chalky in appearance, showing that they are not of perfect structure. The two laterals which I extracted had each a distinct chalk mark, and even if it had been practicable to preserve them for a time they would soon have been useless to him, so that I am convinced of the soundness of my original plan of treatment. Several who have seen the models have not hesitated to say that the canines would have been the teeth they would have removed, although when I explained the structure of the laterals their views coincided with mine. In all cases we know that it is most necessary to make a proper examination of the mouth, as no rule can be laid down which we can declare universal and each case must be studied, but overcrowding of the mouth in all and every case should have our best attention. In this young man's case, if he had not had the attention given him, there would have been rapid decay and entire destruction of teeth that will now be most useful to him. You will observe I have filled an upper molar for him with gold, and he will in time require further help in this direction.

In the discussion which arose at the termination of the reading of the paper, satisfaction was expressed at the mode of treatment adopted and the satisfactory results achieved. The patient being present, opportunity was afforded for a thorough examination of the mouth.

MR. MORGAN HUGHES, L.D.S.Eng., was admitted a Member of the Royal College of Surgeons of England on the 20th ult.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

THE Annual General Meeting of this Society was held on January 11th, Mr. C. SPENCE BATE, F.R.S., President, in the chair.

Mr. S. J. HUTCHINSON related the following case:—In October last a gentleman came to him suffering from almost complete closure of the jaws; he could only separate them about a quarter of an inch, and was, of course, unable to eat. He had been in this condition about a month. Mr. Hutchinson found that the inability to move the jaws was due to muscular contraction, with infiltration and induration of the surrounding tissues, and diagnosed an impacted wisdom tooth, but was unable to make a satisfactory examination of the mouth.

At the patient's next visit gas was administered and the jaws separated to some extent by a screw gag. It was then found that the left lower wisdom tooth was completely buried under the ascending ramus of the jaw; it was also decayed and had an abscess at the root. In order to get at it Mr. Hutchinson felt obliged to extract the adjacent second molar, and this was at once done. After an interval of a few days gas was again administered and an attempt made to dislodge the wisdom tooth, but the patient recovered himself before this could be effected.

Perceiving that the operation would be a difficult one, Mr. Hutchinson arranged with the patient that he should have chloroform at his own house, and this time the tooth was successfully extracted, though not without a good deal of trouble, for the tooth was lying horizontally and buried under the ramus of the jaw.

Mr. Hutchinson thought that the plan of administering chloroform at the patient's own house, instead of at that of the practitioner, reduced the risks and inconveniences of this agent to a minimum. The patient could be operated on undressed and in a recumbent position; he was not fatigued, as he might be when he had to come some distance in a fasting condition, and he was less flurried. Finally, he could lie quietly after the operation and recover himself at his leisure.

Another point of interest in the case was the length of time the contraction persisted after extraction of the tooth. Three weeks after the operation the patient could only open his mouth

three-quarters of an inch, and he had, in fact, only just regained the free use of his jaw, though the operation took place in October.

Mr. CHARTERS WHITE said that about two years ago he had been called upon to treat a precisely similar case. Thinking from the amount of indurated swelling, &c., that there must be some disease of the jaw, he sent the patient to Mr. Christopher Heath, but that gentleman sent him back again, saying he considered it a case for a dentist, and on examining the patient more carefully Mr. White discovered that the cause of the mischief was an impacted wisdom tooth, embedded in the ascending ramus of the lower jaw. The patient could not separate his teeth more than a quarter of an inch, so that it was difficult to introduce forceps, and still more so to manipulate them in the mouth, but Mr. White managed to reach the tooth with some long narrow curved forceps, and to raise it out of its socket, and at the patient's next visit, the swelling having somewhat diminished, he succeeded with the same forceps in removing it altogether.

Mr. HENRI WEISS said that in five or six cases of prolonged operations in the mouth he had used the well-known A.C.E. mixture, composed of alcohol one part, chloroform two parts, and ether three parts, by measure, and had found it act very satisfactorily. The patients recovered quickly, and there were no bad after-effects.

Mr. R. H. WOODHOUSE said he knew that the extraction of lower wisdom teeth was sometimes attended with a good deal of difficulty, and he believed that this arose from overlooking the fact that these teeth, when misplaced, were almost invariably inclined to the inner side of the ramus. He found that by inserting an elevator on the outer side, and making a continuous movement inwards, he could dislodge them without any trouble. He believed the difficulty arose from making an outward movement; it should be entirely inwards.

Mr. A. S. UNDERWOOD said that, in the years 1878 and 1879, Dr. Bödecker, of New York, published in the *Dental Cosmos* some papers on the microscopical anatomy of the teeth, in which, amongst other things, he asserted that the presence of protoplasm between the fibres of the enamel could be demonstrated by staining sections with chloride of gold. He described his process as follows:—He first decalcified the teeth by means of chromic acid, then cut sections, and stained these by placing them in a solution of chloride

of gold, and exposing them to sun-light for twenty-four hours or more. Now up to that time it had always been stated that chloride of gold would only stain tissues which were absolutely fresh. The text-books said it was useless to attempt to stain tissues which had been deprived of life for more than an hour, and a distinguished microscopist to whom Mr. Underwood applied for information on the subject replied that it was hopeless to attempt staining with the chloride unless the tissues were fresh, and even in that case four out of five of his sections would turn out failures.

Wishing to verify Dr. Bödecker's observations, if possible, Mr. Underwood undertook a series of experiments in order to ascertain whether it was possible to stain decalcified sections with this reagent, and what was the best method of using it.

His results with the method described by Dr. Bödecker had been uniformly unsatisfactory; he could not get a single section which showed anything clearly. But he found, nevertheless, that any section could be stained, and that it really did not matter whether it was fresh or not. The method which he had found the best, and which he had finally adopted, was as follows:—

He immersed the section, whether cut from a decalcified tooth or ground down from a hard one, in a solution of carbonate of soda for an hour. Then he placed it in a solution of chloride of gold, which must be neutral, and left it in the dark for another hour. It was then again placed in the carbonate of soda solution for a few minutes, and then transferred to a one per cent. solution of formic acid, and kept warm over a water bath for about an hour and a half. Finally the section was mounted in glycerine jelly, not in Canada balsam. Sections which have been decalcified by chromic acid took longer to stain than those which were fresh, but the whole process only occupied from three to four hours, instead of at least twenty-four as in the old method, and the result would be found far more satisfactory. The usual needles, or any steel instrument, must not be used for manipulating the sections; some non-metallic substance, such as a quill tooth-pick, should be used instead.

He found that the most satisfactory method of grinding down hard sections was to grind them tolerably thin against a fine corundum wheel, and afterwards to finish with an Arkansas wheel. In this way the section could be ground down to any required thinness with little risk of injury.

Mr. CHARTERS WHITE said he gathered from Mr. Underwood's remarks, that though it was possible to stain a decalcified section, it was better to grind down a fresh section and stain at once.

The PRESIDENT remarked, that grinding down a hard section between two Arkansas stones saved both the operator's time and his finger.

Mr. UNDERWOOD replied that fresh sections were not only easier to stain, but were in all respects much more satisfactory than those which had been decalcified, since the former presented the tissues in their natural condition, whilst in the latter they were more or less affected by time and by the reagents. Consequently, when decalcified specimens were used, there was always a doubt whether the appearances seen were really natural, or whether they were the effect of the reagents. He thought the use of the finger was the safer way of finishing a thin section, and if necessary the finger could be protected by attaching the section to a piece of cork or rubber.

Dr. GEORGE FIELD drew attention to some samples of Dennison's absorbent cotton, an American preparation. He had given it a thorough trial, and was convinced that there was nothing which surpassed it as an absorbent for dental purposes.

He wished to suggest a new use for cocaine—new, at least, to some of those present—viz., in the fixing of the rubber down by means of a ligature round the tooth, especially in the cases frequently met with where it was necessary to force both the rubber and ligature between the tooth or teeth and gum, on the approximal and buccal surfaces of the former. His method of using it was as follows:—He first thoroughly dried the cavities and the adjacent gum margins, then by means of a wedge-shaped piece of wood he applied the cocaine between the teeth and the gums, first adjusting a napkin as a protection from moisture. He preferred to use the crystals. Then he prepared the rubber, elastic bands, weights, ligatures, &c., and when everything was ready to hand he made another application of the cocaine. On now proceeding to adjust the dam, it would be found that the ligatures could be forced well under the gum with but little, if any, pain to the patient, provided that the application had been properly made. This operation, which, though absolutely essential for the success of fillings in the position named, was usually exceedingly painful, was thus rendered almost painless; a good view

of the margins of the cavity was thus obtained, with dryness, and it greatly facilitated the removal of all surplus material overhanging the margins of the cavity, an oversight which, in his experience, was the cause of more failures than any other defect in filling operations.

He also offered a few general remarks on the question of the extraction or the retention of roots. When, he asked, should roots be extracted, when retained? When was it advisable to pivot, and when not? Preparatory to the insertion of an artificial denture all roots which could not be put into a good healthy state, fit to receive a crown, should be extracted. In the case of patients who, it might reasonably be expected, would not take sufficient care to keep their teeth, roots, and gums in a cleanly condition, it was wiser to extract all roots; otherwise in from six to twelve months the result of the want of judgment would be seen in swollen face and gums, abscesses, &c., and a state of mouth generally which was a source of great discomfort to the patient himself, disgusting and offensive to his friends, and discreditable to the operator.

He expected to meet with the usual objection—the consequent absorption of the alveoli, &c. But this should have no weight in comparison with the inevitable bad results just named; in addition to which there could be little doubt that the quantity of suppurative matter constantly passing into the stomach must be prejudicial to the health of many patients. If the roots of any of the ten anterior teeth of the upper jaw were strong, pivoting in the best possible manner should be given the preference over a plate, as being less liable to injure other sound teeth and of greater practical service, provided the operation be performed with even a moderate degree of skill; giving special attention to the stopping of the foramen of the root, obtaining a good joint between the root and crown, having no shoulder either of root or crown, and lastly removing every particle of the cement used for fixing the crown which may have been pressed out at the joint.

Speaking from his own observation, he had never yet seen a case for the insertion of a full denture, the conditions or circumstances of which would warrant the retention of the roots; whereas he had met with cases in which the retention of numerous diseased roots covered by a plate had proved prejudicial to the general health of the patient.

He did not present these suggestions as being anything new, but rather to call attention to the fact, which at times seemed to be lost sight of, that the mouth should be treated in the same way as any other part of the body, and that it was the duty of the dental practitioner to maintain it in a healthy condition by every means in his power, therapeutic as well as mechanical.

Mr. STORER BENNETT showed a lower jaw, found at Bath some years ago amongst Roman remains, which had been presented to the Museum by Mr. Forsyth. On comparing it with a typical modern specimen several differences would be apparent, especially the distances between the condyles and the large size of the ascending rami. There was but slight mental development, and the teeth were not quite regular; they were much worn, but there were no signs of caries, and, contrary to what might have been expected, the wisdom teeth were small.

Dr. GEORGE CUNNINGHAM showed some specimens illustrating the difficulties and disappointments of Continuous Gum Work. He had used the same furnace (Verrier's) throughout, the details of the process had been carried out in the same way and with the same amount of care, and yet after a period of success, when he thought he had conquered all difficulties, several cases in succession had turned out badly, the enamel being unequally fused and cracked on the outside of the plate. He could not himself explain the cause of his non-success, nor could he get any one else to explain it. The only difference between the good plates and the bad was in the enamel used, though both had been obtained from the same makers, the S. S. White Company, but that used for the successful cases had been on hand a long time, whilst new enamel had been used for the failures. He should be very glad if any one present could tell him whether their experience had been at all similar, or could enlighten him as to the probable cause of his failures.

He wished also to call the attention of the Society to Dr. Land's suction chamber; he handed round a denture made according to his pattern. Dr. Land's suction chamber was large but shallow. He himself had for some time past altogether abandoned the use of these chambers and used the Fulsome ridge; but lately he had been induced to make some comparisons between the two, and had found Dr. Land's method of great use, and he could therefore recommend others to give it a trial.

Dr. WALKER said he had met with the same difficulty in firing continuous gum cases, using Verrier's muffles. He would suggest that the bad results were due to the unequal temperature of different parts of the furnace, and that this might be obviated by having a better supply of gas. He thought that if Dr. Cunningham would have a larger supply pipe fitted, not less than $\frac{3}{4}$ inch diameter, inside measurement, the heat would be equalized, and he would meet with no more failures of this kind.

Mr. D. HEPBURN called attention to the following plan for improving the adhesion of suction plates. All must have experienced the difficulty which was not unfrequently met with in establishing the confidence of patients in suction plates, especially when first applied. Even with the most perfect model, the most accurately adjusted arrangement will often at the first offset show no tendency whatever to adhere to the gum, and the patient may have to undergo many days of discomfort before adhesion is established. He had tried to overcome this difficulty by coating plates with various substances of an adhesive nature, in order to spare the patient a disagreeable ordeal, and he was aware that similar attempts had been made by many other practitioners. Thus he had tried sprinkling the plate with flour and painting it with various gums and mucilages, but with little success, most of these substances being rapidly dissolved and washed away. For about a year, however, he had employed powdered gum tragacanth with the most satisfactory results. Indeed, the most refractory plates, when this substance was used, would adhere with a certain amount of tenacity, and frequently could not be dislodged without a considerable effort.

The best method of application was to keep the power in a bottle with a piece of muslin tied over the mouth, and to sprinkle the plate with a thick layer of the powder before putting it into the mouth. The saliva would in a short time convert the tragacanth into a glutinous and almost tasteless layer which would remain for days. In obstinate cases the patients could themselves apply the powder daily, and found much comfort from so doing.

This use of tragacanth had been suggested to him by a patient of great ingenuity, and he had never met with any substance which would act so efficaciously. Having experienced its utility himself, he wished to suggest its employment, for the purpose referred to, to other members of the Society.

Mr. R. H. WOODHOUSE said he had found powdered gum arabic of some use in such cases, but at the suggestion of Mr. Hepburn he had lately used the powdered gum tragacanth and had found this very much better.

The following Gentlemen were elected as office-bearers for the ensuing year:—

President—T. Charters White.

Vice-Presidents—(Resident)—George Gregson, Henry Sewill, and S. J. Hutchinson. (Non-Resident)—Richard White, Norwich; Andrew Wilson, Edinburgh; and Richard Rogers, Cheltenham.

Treasurer—James Parkinson.

Librarian—Felix Weiss.

Curator—Storer Bennett.

Editor of the Transactions—Frederick Canton.

Honorary Secretaries—David Hepburn (Council); Robert H. Woodhouse (Society); and Willoughby Weiss (for Foreign Correspondence).

Councillors—(Resident)—William St. George Elliott; Augustus Winterbottom; Samuel Cartwright; Morton A. Smale; J. Howard Mummery; Arthur S. Underwood; C. J. Boyd Wallis; E. G. Betts; and J. F. Corbett. (Non-Resident)—W. E. Harding, Shrewsbury; Robert Reid, Edinburgh; J. R. Brownlie, Glasgow; J. H. Whatford, Eastbourne; F. H. Balkwill, Plymouth; and George Brunton, Leeds.

The Treasurer reported that the total receipts during the year ending October 31st, 1885, had been £513 13s. 5d., whilst the expenditure had amounted to £426 19s. 10d., leaving a balance in hand of £86 13s. 7d. The assets of the Society at the end of the financial year amounted to £2,580 1s. 10d. Twelve new members had been elected during the year, whilst there had been seven resignations, five deaths, and three names had been removed from the list on account of non-payment of subscriptions—a loss of fifteen in all. The Society now consisted of 315 members, viz., 121 resident and 194 non-resident members, besides 43 honorary and corresponding members.

The Librarian reported that 55 members had availed themselves of the privilege of having books, and 80 students had taken advantage of the liberality of the Council. The additions to the

Library by purchase consisted of 65 volumes, while the exchanges and books presented raised the number to 100.

The Curator also presented his report, after which the President delivered his

VALEDICTORY ADDRESS.

The time has now arrived when it is my duty to resign the position with which I have been honoured for the last twelve months. It is the highest professional distinction that any man can hope to attain, and one of which he should needs be proud, viz., the President of a Scientific Society, the object of which is the elucidation of practical and theoretical phenomena connected with the profession of which he is a member.

The Odontological Society has in the past done much to bring its members together in the bonds of friendship, particularly amongst those who are ever students and insist on progress.

One of the greatest hardships that the followers of the dental profession has had to contend against is the want of knowledge and general appreciation of the value of the organs which they study.

A strong illustration of this is exhibited in the order issued by the Board of Admiralty to its medical officers—that no lad shall enter Her Majesty's navy who has lost more than five teeth.

The age at which a lad enters the service is about fourteen years; at this time he has all his teeth in a forward condition, excepting the four last molars. Assuming that his teeth are sound, he has a practical set of twenty-eight teeth in a forward state of development.

The condition of a lad's mouth at this age is that, although the teeth may be sound, the jaws in a large average are contracted, the teeth are frequently crowded and compressed, the larger and finer the teeth the more intense may be the irregularity, so that the loss of two teeth in each ramus of the jaws may frequently be found desirable to allow room for those that remain to be able to stand in the line of an even arch.

It is not infrequent that we find the four first molar teeth are hopelessly riddled with decay at a very early age, and if they should be removed before the second molars have protruded themselves through the gums, the position they once occupied can in the adult mouth only be determined by experienced observation. Should the teeth anterior to these be irregular, the two first

bicuspid might be moved, and in exceptional cases, when the arch is narrow, the lateral incisors might also be removed, and yet the dental arch be retained in its even regularity.

Thus occasionally six teeth, and not infrequently four, might be judiciously removed from each of the jaws, with advantage to the future and healthy condition of the mouth, and the permanent utility of the teeth improved.

Thus eight or twelve teeth might be removed from the mouth, and the person gain by the loss; while, on the other hand, four teeth only might be lost, and the set made weak as a masticating organ. For instance, the loss of two first molars from the lower jaw and the two second from the upper, or the four molars from either jaw, would not exclude a lad from entering Her Majesty's navy, while he who lost two lateral incisors and four bicuspids, that is, six teeth, would be excluded. The lad who lost the four non-corresponding molars would have a feeble organ of mastication, whereas he who lost the five above mentioned would have an improved apparatus, as would also he in whose mouth there was an abnormal degree of irregularity, if under experienced knowledge, six, eight, or more teeth were judiciously extracted. The stringent rule of the Admiralty thus excludes many good lads from serving in Her Majesty's navy and their places be taken by others with less efficient dentures, although they come up in healthy appearance to the Admiralty standard.

Experience, moreover, teaches that many youthful mouths in which regularity and promise of beauty exist, will, if neglected, exhibit in a few years the signs of interstitial decay, the incipient stage of which is only apparent to trained and cautious observation. This fact, so frequently demonstrated in the lives of the middle and upper classes of society, where much thought and care are taken of the teeth, must be largely aggravated in the class from which our navy is recruited.

This liability is due to the close contact of large and well-formed teeth in jaws scarcely large enough to hold them—a characteristic that is frequently only made apparent in the defective form and irregular position of the last tooth developed. I mean the *Dens sapientia*. In such mouths a liberal and judicious removal of the weaker teeth, in the earlier stage, while the disease is yet of an incipient character, would remove the lateral pressure which produces the conditions which induce decay.

If, however, such a system were pursued towards a lad who was a candidate for the navy, he would be excluded from entering that service if he had lost more than five teeth, no matter how unimportant those teeth might be.

It must be remembered that I am speaking of youths who have never heard of a tooth being plugged or treated in any way excepting by extraction, the consequent pain of which defers the operation until the pain it causes appears relief to the suffering that is endured.

The teeth of this class are generally neglected and allowed to overcrowd each other to a great extent, and the consequence is that future injury to the teeth is induced by the neglect of a judicious weeding.

Nor is decay the only trouble likely to arise from the existence of a crowded denture.

Lateral compression is the source of much distress, and often the cause of obscure pains, both in the teeth themselves, as well as by causing neuralgic affections. This is more or less frequently illustrated in the irregular position of the third molar tooth. The troubles that arise from this ill-developed organ are, I believe, mostly due to the cramped position in which it is constantly found, and which, I believe, would be largely reduced by the removal of the first molar, wherever the latter is decayed, prior to the development of the second molar tooth.

There is another disease that has of late years been drawing the attention of our profession, the study of which will yet require considerable and extensive observation before we can be supposed to have arrived at a conclusive theory of its true nature and origin.

I mean that tendency for the teeth under certain obscure conditions to become loose and fall out while yet in a healthy state long before their value as masticating organs is impaired or their work done. Sometimes, whatever the disease may be, it is found to attack one or more teeth, and these not in approximate position to one another; again it will be found to attack all the teeth in one jaw and none in the other, and sometimes all the teeth in both jaws, occasionally sparing one or two which seem to withstand the disease, but succumb at last to the general loss of osseous support rather than from the progress of the disease itself. For several years I, as well as others, have given some attention to

this affection, and pursued observations that bear more or less immediately on it with a desire to ameliorate the distress when it occurs.

Unfortunately the disease is brought to our knowledge when it has advanced too far to do more than to ameliorate, and the removal of the teeth affected is the immediate, or not long deferred, result.

Inspection of such a set will show, where the disease is defined and well pronounced, that the gums are red and swollen, the gingival processes are large, loose, and protruding above the natural margin to an extent that sometimes equals the height of the teeth which they surround. If these gingival processes be laid back the teeth will be found, according to the length of existence or virulence of the disease, to be separated from the gums to a more or less considerable degree, and along the exposed surface of the tooth granular masses of hardened calculus will be found attached to the root, with an adhesion that is astonishingly secure. Within the pockets formed by the enlarged gum growth around the loosened teeth, there is a fluid that much resembles pus in appearance, but which when placed under the microscope is seen to be of very different construction.

This fluid is found to contain a mass of fungus germs of the bacillus and micrococcus type, which frequently exist in such an active condition that they swim in the field of the microscope in wavy lines like young tadpoles. Attached to surfaces the form attains a rod-like condition that grow to a considerable length, which break into smaller lines and multiply accordingly, but whether, as I believe, they originate in the smaller micrococci I cannot say.

Now, if we turn to another source of examination, we shall find a similar supply of material under other and separate conditions.

If we examine the surface of a piece of artificial substitute that has been worn in the mouth of a person who has not taken any remarkable degree of care of the same, we shall observe that at certain spots an accumulation of material takes place; if this be removed a more or less adhesive condition exists between the material there lodged and the plate on which it rests. If it be removed it will grow again, and this takes place either on gold or vulcanite, and it produces a mark on the surface of the plate. It

commences generally in small round spots, which gradually enlarge in height and diameter.

Microscopic examination of these several spots shows their resemblance with the deposits formed within the gingival pockets at the base of the teeth. This, I think, clearly demonstrates that both these conditions are obtained from an external source, and that in both it is the same. Although not in the same active condition, they exhibit the stationary rods and active and wandering bacilli and micrococci mixed with them.

Although the presence of these fungus germs may be the active agent of the inflammatory state that induces the absorption of the alveolar margins, yet the early conditions which enable these foreign bodies to establish themselves and thrive must be looked for in a more distant stage, and have relation to the constitutional character of the tissues. I must now ask those who follow me to accept for the present the conclusiveness of my observations, and if their experience hitherto does not induce them to accept mine at once, that they will be good enough to defer their judgment until they have had time to compare my conclusions with their own opinions before arriving at a distinct theory on the subject.

I believe that lateral compression is the predisposing cause of that distressing condition that leads to the waste of the alveolar process. The jaws not being large enough to allow the teeth to range themselves in their normal position, the teeth stand crushed together in almost every form of irregularity, some within and some without, and others elevated above or depressed beneath the normal line of the dental arch.

One of the commonest and most prevailing instances may be frequently observed in the lower frontal teeth. The lower jaw being small, the canines, the strong fronto-lateral buttresses of the jaw, are situated too near each other to allow of the four incisors to stand in the normal arch between them; the consequence is that pressure forces the incisors above the level of their correct position and range themselves like a fan, spreading from a common centre. If they do not rise above the level of the others it is because they have been forced out or in beyond their normal lines; in either case the tooth becomes marked for an early attack that ends in its becoming loose and falling out.

I do not think that I can illustrate better the cause and progress of the disease than by recording the history of a mouth in which

several sound and healthy teeth can be traced to have loosened and been lost as a direct consequence of lateral pressure.

The mouth to which I refer I have had the opportunity of a more or less constant revision for many years. The teeth were sound, healthy, and strong. Three or four were plugged with gold in their buccal and coronal surfaces, but the stoppings were small and protective rather than restorative.

The teeth were all regularly developed in an even arch excepting the right upper central incisor, which had to be turned by mechanical contrivance. This state of things continued until the third lower molars appeared, and then a change came on that may best be understood by the following account.

The lower wisdom teeth were cut when the patient alluded to was twenty-two years of age; the first came through with much distress and some pain, which latter was felt chiefly between the second bicuspid and the molars on the same side.

My advice was—and I much regret that it was from some cause not carried out—the removal of the newly developed tooth.

The pain between the above mentioned teeth, though not severe, was frequent, and often present for many days at a time, and latterly in connection with a similar distress corresponding in position with the first bicuspid on the same side.

These pains were evidently between the teeth and not in them, as the teeth were not tender to the touch; but the interdental gingival processes were sensitive and suffered distress from the presence of food, and the teeth generally were tender to mastication.

A year or two after the wisdom tooth on the right side came into position, that on the left followed with more local and immediate, but with less general and continuous disturbance.

With this latter tooth a phagedenic ulcer spread over the inside of right cheek, palate and fauces, and for several days the erysipelatous symptoms were severe and acute, and were chiefly reduced by a lotion of the bichlorate of potash.

When this condition of things subsided, the mouth for a time was apparently well; but whenever there was any gastric disturbance the gums became irritated and the teeth tender in biting, and occasionally the disturbance would increase to a distressing degree.

The gentleman not consenting to have the wisdom teeth

removed, I remember passing a file between the first molar and second bicuspid teeth on the right side—(remember, I am writing of forty years ago)—and procured for my friend a relief that was decided in degree and permanent in its durability.

Time, however, obliterated the space cut between the teeth, and although the disturbing pain never returned to the same extent, a new and different condition of things arose. The wisdom teeth came better into place, but it was found that the upper incisor teeth were being projected forward by the pressure of the lower incisors against them, causing teeth that were once in close contact to be forced apart to a considerable extent. At the same time the gums corresponding with the position of the lower incisors exhibited evidence of becoming thickened and disturbed.

It now began to settle on my friend's mind that it would have been better had the wisdom teeth been removed earlier.

This was now done, and for several years all trouble disappeared; the teeth were strong and healthy; with the exception of the second bicuspid on the right side that had been filed, no symptom of decay was visible.

It will be remembered that the chief distress fell on the molar teeth of the lower jaw and between the bicuspid and canine on the right side. Now the history culminates in this point, that all the teeth that suffered most from lateral compression became loose and fell out. The alveolar processes of the second molars, both the inner and the outer alveolar walls of the first molar on the right side, wasted away, as well as the outer wall of the bicuspid alveolus.

I think anyone who has followed me will agree that had the wisdom teeth been removed when it was first proposed, much of the later condition of things would have been arrested, and I think that we are justified in tracing, as cause and effect, the loss of these teeth to the action set up by the presence of teeth in a jaw too small to retain them without considerable lateral pressure.

If we follow up this by observations under other and different conditions, we shall remember how in the irregular position common to the lower incisor teeth we see one tooth forced outward and another too far back, how the too advanced teeth lose their hold on the adjoining tissues through the absorption of the alveolar walls, and how, on the other hand, a large fold of the gingival margin fills up the hollows caused by the retiring teeth and forms

pockets into which the saliva penetrates, holding in solution calcareous salts and fungoid germs.

The tartar never deposits on soft and living tissue, but rests only on the hard and fixed structure of the teeth, following closely on the separation of their vascular attachment. These fungoid germs, that we recognise under the names of Micrococci and Bacilli, induce an active local inflammatory condition of the gums that is followed by the absorption of the alveolar processes, the wasting of which removes from the teeth that support which their presence gives. The teeth become loose, and in a short time become useless as masticatory organs and fall out. That we may be able to know and trace the pathology of the disease is to enable us to arrive at a correct method of treatment upon a scientific basis.

At present our treatment is empirical, and therefore only remedial. We may scrape the salivary calculus from the teeth, sponge and syringe the softer tissues with any specific we like, but we only reduce the action and do not remove the source of the disease.

No doubt but that topical treatment does relieve trouble and reduce the activity of the disease, and when thoroughly carried out with the cordial support of the patient the value of the teeth may be retained as useful organs fulfilling their capacity for some time longer.

The true origin of this disease is to be found in the great lateral pressure that is reduced by the teeth being larger in proportion than the space in which they are arranged, which is, I believe, the beginning of those conditions which enable the germs of the disease to take root.

In a young person we find the vascular folds of the gum often very conspicuous, a condition that is not present when the teeth are duly spaced. If I am correct in this belief, our treatment must be preventive rather than curative, and in those mouths in which it is more desirable that the teeth should be useful than ornamental, it is important that undue crowding of the teeth should not be permitted.

Thus in the treatment of the teeth in the class from which our military and naval forces, as well as the industrial occupations generally, are recruited, it is the duty of those who have the management of the same rather to secure a healthy denture than

to seek to retain those teeth that are conventionally ornamental, and if in any situation in life it is desirable that none should attain a footing in it without a normally good set of teeth, it is still more important that such individuals should have their teeth under regular supervision during the time that the dentinal tissues are becoming consolidated and are less liable to resist conditions that are injurious to them.

If a boy enters the navy at fourteen years of age with a model denture in form and healthiness, it by no means follows that the teeth will retain those conditions if treated with neglect. It therefore appears to me that it is as important that the mouths of the boys that enter the navy should have that supervision which is necessary for their permanent healthiness as it is necessary to fix an arbitrary rule prior to those entering the service as to the number of teeth they may possess.

The question arises, how is this supervision to be attained? I can only suppose that if it be an important feature in a sailor's life that he should possess a good set of teeth, then it is desirable that the medical staff of that service should be educated in the knowledge of the organs, and it should be their duty to attend to them. And we might suppose that on board a ship of war, where there may be five hundred to a thousand men, the L.D.S. Diploma of the Royal College of Surgeons would be of greater practical value than the Midwifery Diploma of the same College, yet the latter is, I believe, a compulsory qualification.

Nothing can induce more to the risk of a ship, or the loss of an important strategic position, than a sailor in a night watch, or a soldier on guard, suffering from the most acute of known pains such as is producible from diseased state of the teeth.

And when we consider the importance that the wealthy attach to their teeth, the large amount of money and time that they bestow on them, I think that we may give a thought to our poorer fellows who have to bear the brunt of storms and wars, and urge that those who are trained to look after the general health shall be educated to treat the teeth as much as the other organs of the body; and I feel assured that it will be found that many of the neuralgic pains more or less immediately connected with the teeth, and that dyspeptic condition of many a man, would disappear if the naval and military surgeons had the Diploma of Dental Surgery as well as that of Midwifery.

In the early portion of this address I said that the Odontological Society had done much good in bringing together the members of the profession; but I think that more might be done.

To know a great or a good man is to follow and emulate him. To know personally those of our profession whom we acknowledge as being greater than ourselves is to try to be nearer to them.

For this purpose members come to this Society and listen to communications of educational interest and practical value; but many who come from a distance listen to what has been read, and that which has been brought out in discussion, and they see many of whom they have heard;—the meeting breaks up and they return home with an increase of information, but with a feeling of disappointment, for those to whose acquaintance they had aspired may have brushed them with their coat as they passed, but still to them they are only as brilliant lights, while they are still in the shadow.

If once in the course of the year, when the season is bright and London is pleasant, the Society were to have a reunion or conversazione, where the members might meet and know one another, where each might select and ride his own peculiar hobby, by a knowledge of each other the members would learn to respect and appreciate each other, and in my humble opinion the Society would increase in numbers by bringing from the more distant parts of the country those who desire not to be lost in the isolation of obscurity.

Before closing these few remarks I should like to express my indebtedness to the Committee for being so lenient to my shortcomings, and to the two Secretaries, Mr. Woodhouse and Mr. Hepburn, for their obliging attention in overcoming any difficulties that may have arisen but for their experience and attention.

After the usual votes of thanks, the Society adjourned.

ODONTO-CHIRURGICAL SOCIETY.

At the December meeting of this Society, which took place in the Society's Rooms, Edinburgh, Mr. W. BOWMAN MACLEOD, President, in the chair, the discussion upon Dr. H. H. Edwards' paper, on the "Missing Incisors in Man" (see DENTAL RECORD, Vol. V., page 562), was opened by Mr. WILSON, who said he had

listened to the reading of the paper with much pleasure, and he was very much pleased to learn that the short paper he had read to the Society in March had had the effect of bringing into the field such a close observer and skilful artist as Dr. Edwards.

Case 1 shows a state of the incisors he had never seen in the permanent series, and but twice in the temporary. He differed from Dr. Edwards in that he considered the extra teeth to be not the central pair, but the first lateral, although these are remarkable as being larger than the central; one thing certain was that it was not the second, or outermost lateral pair.

Cases 2 and 3 represented cases with which most present were familiar.

In Case 4 he did not see any ground for calling the incisor in relation to the right canine anything but a dwarfed normal lateral, difference of form in the pair of these teeth being not unfrequent, and the space between it and the central was not so large as to require accounting for.

In Case 5 the space occupies the line of the maxillo-premaxillary suture, and is more likely to be connected with the development of the bones than with the teeth.

Case 6 was, in his experience, a common form when the laterals were suppressed.

In Case 7 the incisor between the central and canine on the right side he regarded as a dwarfed normal lateral, and case 9 only differed from it in that the lateral is more rudimentary in form. In the majority of similar cases which had come under his own notice, the solitary lateral was conoid.

Case 8. The tooth so beautifully reproduced in ivory he did not consider a geminated tooth at all, but what was much rarer, a double-rooted lateral, the extra root being due to the malformation of the cingulum, the two sides of which had not united, the small root being a continuation of the distal half.

Laterals were extremely liable to have the cingulum malformed, but it was certainly very rare to find it resulting in an extra root, as in this case.

He had only met with one, which he would pass round, and they would see that it only differed from Dr. Edwards' one in that the distal root continued in contact with the larger root.

As showing that the same thing occurred in other teeth, he passed round an under canine, in which they would see that a

fault in the labial cervical margin of the enamel was accompanied by the presence of an extra root, which started just a little below the neck on the same surface.

As regarded the use of the term "geminous tooth," or as more frequently styled geminated, Dr. Edwards was quite correct, as there were three forms—1st, lateral union of both crowns and roots; 2nd, union of crowns, roots more or less distinct; and 3rd, crowns more or less divided, roots united.

The existence of one or more pulp cavities and canals, depending on the extent to which the conjoined teeth had lost their individuality.

The quotation from Dr. Thomson's paper, however well it might apply to members liable to hypertrophy or atrophy, according as the individual used them, bore little on the subject before them. Hereditary defective structure was extremely general, but certainly not any prevalence of aberrant, or rudimentary forms. Conoid laterals, bicuspid, and third molars are still in a small minority.

It might be said that want of use leads to defective development of the jaws, and that in turn to suppression of certain teeth owing to want of room, but this conclusion is largely an assumption.

Undoubtedly rudimentary forms in certain teeth, as also suppression of the same, are hereditary more or less for a generation or two, but the customs of civilised man do not encourage their persistence. In the lower animals either could readily be made a permanent variety.

As to the suppressed incisor being the central one, he thought that on two grounds they might put it out of court—1st, the incisors in man being largely prehensile, and the centrals normally the strongest and most important, they should be the last to be suppressed; 2nd, when five or six incisors are present, it is very exceptional for more than two (the centrals) to be of the central type.

No conclusion can be drawn from the period of eruption, as in the permanent series the overcrowding frequently leads to the retarded eruption of the centrals long after the laterals and supernumerary teeth were in place. In two cases of extra incisors, which came under his own observation, the middle or second incisor erupted after both the central and outer incisor

were in place. While in the third all four laterals were more or less advanced (the outer ones most so) before the centrals erupted.

In the temporary series there was little irregularity produced by their presence, but there seems a strong tendency to the extra incisor being geminated to one or other of the normal ones.

What he regarded as the typical form of the lateral incisor was just that described by Dr. Edwards. It differs from the central (taking its labial aspect only) in being more V-shaped, in its lateral convexity being greater and most pronounced nearer to its mesial side, and in being shortened to and rounded off at its distal cutting edge.

Digressing to the missing premolars, his own observations would lead him to say they were the third and fourth.

As regarded the supernumerary teeth not unfrequently met with to the buccal surface of the molars, he was rather puzzled, having met them between the first and second, second and third, and in one case to the distal side of the third molar. He had also met with a few cases in which they were geminated with one or other of the molars. So far as he had seen they differed considerably in form from those met with in the front of the mouth.

He was afraid he had occupied too much of their time, and would conclude by asking them to compare closely the lateral and canine he had sent round with the lateral (Case 8) of Dr. Edwards', and say whether they agreed with him.

Mr. AMOORE said he had listened with great interest to Mr. Wilson's close criticisms upon the paper, and if there was more to be learned from differences of opinion than from concurrences, they might hope to learn something from what they had heard that evening. He dissented from Dr. Edwards in his opinion that, of the incisor teeth, the centrals would be the most likely to be suppressed first. To quote from the text of his paper—"The incisors are the teeth of prehension, and the centrals naturally are the most prehensile; therefore, if suppression has taken place through disuse, I infer that the original centrals would be the first to disappear." Now, if suppression has taken place, it would surely be the less used side teeth which would disappear previous to their more serviceable central neighbours. This view is borne out by references to comparative dental anatomy, where the side teeth sometimes become quite rudimentary or are lost,

while the centrals often rather developed and increased in size and strength.

He then exhibited a model of a well-formed upper jaw in which there were two teeth erupted buccally between the second and third molars, and which tallied exactly with a similar case referred to and described by Dr. Edwards. One of the supernumeraries had been extracted and showed a conical root, while the crown more resembled a bicuspid than a molar, and although he had no strong grounds for his opinion, he could scarcely bring himself to believe that they were representative of a lost third pre-molar, springing up in this out-of-the-way position; he thought it rather straining a point, whenever a supernumerary tooth appeared, to give to it a place as a reappearance, in imperfect form, of a tooth once commonly present but now suppressed. In the same way he differed from Dr. Edwards, though confessing that he had not given the matter so much attention as he (Dr. Edwards) had done, in so often assigning, as a reason for spaced teeth, that it was an effort on the part of Nature to allow room for a tooth once present in the jaw, but now absent. This was notably the instance in Case 5, already referred to by Mr. Wilson, in which a space existed between lateral and canine on the one side of the mouth only, and, as had been remarked, was more likely to have been caused by an irregularity in the development of the bone at the inter-maxillary suture—or possibly the undue retention of a temporary tooth on that side, or it might even be due to an irregular articulation with the lower jaw. How common it was to find, when the laterals were absent, that the centrals were spaced, and when, during of eruption of the incisor teeth in children, a long interval of time elapsed between the appearances of the centrals and laterals; the centrals often remained with wide spaces between them until the laterals came down, when the space gradually closed up. He had models of a jaw in his possession which he should have liked to have had Dr. Edwards' opinion upon; it was a typically well formed and faultless mouth and jaw, with the teeth all present, but on either side between the canines and the first bicuspid there existed well marked spaces. From their position he would attach no significance to the circumstance, attributing it rather to the effect of articulation with the lower jaw than to any other cause. Returning, however, to the missing incisor again, he had a case, of which, he regretted, he was unable

to exhibit the models. In it a temporary supernumerary lateral was succeeded by a supernumerary permanent lateral, in either case it being impossible to determine, from the crowns, at all events, which was the extra tooth.

With regard to the carved ivory model of a lateral tooth, which they all admired so much, he was more inclined to agree with Mr. Wilson's views upon the question, and think it more probably a double-rooted lateral than a geminated tooth, although he scarcely thought that the teeth Mr. Wilson had passed round proved his point, though they certainly tended to confirm it.

He trusted that any exceptions that he himself, among others, had taken to Dr. Edwards' paper, would not be taken as due to a want of appreciation, but when, as in the present instance, there were so very few reliable data to argue from, there would necessarily exist many differences of opinion.

After several members had taken part in the discussion, the PRESIDENT said that nobody would be more pleased than Dr. Edwards himself in reading those opinions which differed from his own opinions. The whole of the paper was more or less a tentative one, expressing views which might reasonably be deduced from facts accompanying it, but by no means claiming for these views the value of demonstrated deductions. The great object Dr. Edwards seemed to have in his paper was to contribute a few more facts bearing upon an interesting and much neglected vein of research, in order that interest in it might be further awakened and perpetuated in this direction, and tend to the collection of such a mass of instances and illustrations as would furnish a sufficiently broad basis upon which to build a conclusion. The paper had most admirably fulfilled its purpose, and he hoped that they would be frequently favoured with communications from their youngest corresponding member.

The PRESIDENT then called on Mr. Watson for his promised demonstrations for the evening.

Mr. WATSON proceeded to give an exhibition of slides, illustrative of Dental Pathology and Physiology, by means of the Limelight Lantern Microscope.

Without attempting to describe the instrument technically, there were a few points in connection with it that would be interesting to remark upon. To fit up the lantern for the microscope, the ordinary objective in connection with it is removed,

and the microscope lenses and apparatus screwed on, the objectives used on this occasion being 150, 90, and 30 diameters, on the relative value of which, in connection with the lantern, some remarks are made further on. One of the most ingenious contrivances in connection with it was the method by which a continual supply of oxygen could be maintained without the inconvenience usually attendant when bags are employed. The gas-holder consists of a bell capable of containing about $1\frac{1}{2}$ cubic feet of gas, inverted in a water chamber below, holding a good sized bucket full of water. This arrangement when in use serves as a stand for the lantern, and when emptied for travelling, the lantern can be packed away within it. The supply of oxygen is obtained from heating by means of a Bunsen burner, a cake made of powdered chlorate of potash, and the black oxide of manganese enclosed in a strong iron retort, whence the oxygen is evolved and conducted by a tube into the gas-holder; when more gas is required, another cake is supplied, and the process repeated, and thus a persistent supply of the gas can be maintained as long as desired.

The exhibition was a very interesting one, and showed the microscopical conditions of the teeth, from the germ to maturity, and in the different stages of disease; and towards the end sections of tumours having relation to the mouth were also exhibited. The sections were best seen with the lower powers of the microscope, as at present it was impossible with the instrument to bring out the smaller details as clearly as when the object was examined upon the stage of the microscope in the ordinary way, the definitions becoming indistinct as the powers were increased.

Later on, Mr. Watson exhibited some photo-micrographs of the dental structures, in which the details were brought out in a very satisfactory manner, and if by further adjustment and development the lantern microscope could be made to transmit as clearly the image, from the mounted specimen to the canvas direct, it would prove an almost indispensable instrument for purposes of instruction in class lectures.

At the conclusion of the exhibition, the President complimented Mr. Watson on the success of the demonstration, and tendered the thanks of the Society to Mr. Watson for his interesting and instructive exposition of the microscopic structures of the teeth.

On January 14th, the third General Meeting of the Session was held, the President, Mr. BOWMAN MACLEOD, in the chair.

Mr. PRICE was called on for his remarks on Dr. Coffin's method of treating irregularities by means of the "split plate" and the use of piano wire. Through the kindness of Mr. Harold Coffin, he was enabled to exhibit a large series of models, illustrating the different types of results that could be obtained through its agency; and also plates and cases in the various stages of preparation, showing the most advised methods of construction. As the subject had been so thoroughly treated by Mr. Walter Coffin, and already chronicled in the Transactions of the International Medical Congress in 1881 (vol. III. p. 542; also in DENTAL RECORD, Vol. I. p. 112), it was thought unnecessary to republish any of the matter in the Society's Transactions, but as many of those present had either not seen, or had had no opportunity of examining the models at leisure, they were the occasion of considerable comment, and some of the details of their construction and technical "wrinkles" were new to several. Many of the members who had adopted it testified to its simplicity and value, at the same time venturing to doubt if, in some of the examples before them, the expansion treatment had not been ill advised, and that extraction would have yielded better results; but as they had not the lower articulations with them, nor the contour of the patient's face to assist them in their judgments, they were unable to pronounce any final opinion.

In summing up the opinions of members, the PRESIDENT said that he regretted very much the impossibility of sharing with absent members the great good which those present derived from the presentation of such a practical subject in the form in which it had been brought before them. Most of the members questioned the expediency of some of the operations for expansion of the arch as illustrated by the models on the table, and he quite agreed with them, and very possibly Mr. Coffin might now also share their views. One thing, however, was certain, that the introduction by Mr. Coffin of piano wire for regulation of teeth and expansion of the arch was a decided step in advance of any previous contrivance for these purposes. It was a remarkable illustration of the power of simple instruments when directed by brains. He had much pleasure in moving a cordial vote of thanks to Mr. Coffin for the

loan of the series of illustrations, and also to Mr. Price for his most entertaining and lucid description of them.

COMMUNICATIONS.

A casual communication from Mr. John Wood, Dumfries, was read, referring to the untoward accident in Mr. Saunders' practice at Barnstaple, in which the blade of a pair of upper bicuspid forceps broke off during an operation, and slipping down the trachea, became lodged in the right bronchus, from which it was extracted by Sir William M'Cormac, seven weeks afterwards. It appears that the broken instrument has the name of "Evrard" upon it, but some doubt has been expressed as to whether it is a genuine instrument of his make, or merely an imitation of a spurious character. Be that as it may, by way of showing that such an accident is possible, even where there can be no question as to the genuineness of the manufacture, I submit for inspection by the members of the Society, a pair of excising forceps by Evrard, in which there is a fracture extending half way across the neck of the left blade in pretty much the same situation, and so far in the same direction as that which the line of fracture takes in the broken pair figured in the *Lancet* and the *Journal of the British Dental Association*. As will be observed, however, the fracture in this pair, instead of continuing its course *across*, has taken an inclination towards the line of the handles, which in some measure accounts for the blade not breaking off altogether, as in the Barnstaple case. That this instrument was made by Evrard is beyond dispute. It bears the well-known impress of his name, and forms one of a set of twenty instruments furnished by the late Mr. Evrard to special order, and presented to me by a patient. The mishap to this pair happened a short time ago, whilst being used in excising an upper front tooth, and surprised me not a little, having regard to the apparent strength of the part at which they gave way.

Mr. STIRLING showed a continuous gum facing, from Verrier's furnace, where the platinum wire was soldered to the pins of the teeth with dental alloy. He said the advantage of dental alloy over pure gold as a solder is that it remains around the pins (where it is placed) until after the piece has been finally fired, whereas the gold usually runs away from the pins and flows all over the platinum wire.

Mr. STIRLING also presented to the Society's museum the molar of a horse, the roots of which were involved in an odontome of considerable size, and which he had exhibited at a previous meeting.

Mr. WILSON exhibited an upper lateral, which simulated in a remarkable degree a lower canine.

Mr. MACGREGOR showed two models, the one of the mouth of a girl of 15, with a well marked V-shaped maxilla. The teeth were prominent, and he judged that the conformation of the mouth was due in a very great measure to the habit of food sucking, of which he knew the patient was guilty.

The second model was of the upper jaw of a girl of 12, and was peculiar in exhibiting a first right bicuspid of abnormal size and shape, from its appearance giving one the idea that it was probably a geminated tooth.

THE DENTAL HOSPITAL OF LIVERPOOL.

THE Twenty-fifth Annual Meeting of the Dental Hospital was held in the Town Hall, on January 14th, the chair being occupied by his Worship the MAYOR.

The SECRETARY read the annual report of the Committee, which drew attention to the circumstance that the hospital had now completed the first quarter of a century of its existence, during which period the total number of patients admitted had amounted to 154,942. Last April a branch establishment was opened at 15, Great Mersey Street, since which date, to the close of the year, the patients admitted there had numbered 1,267, and the operations performed 2,060. This branch would entail an extra £100 per annum expenditure, and the Committee asked the public for further subscriptions. During the past year the total number of patients at both establishments was 14,681, and of operations 20,949—a large increase in each case over the numbers of the previous year, which were the highest attained up to that time. The patients' voluntary contributions during the year at Mount Pleasant amounted to £56 19s. 3d., and at the northern branch, for the eight months during which it had been opened, £8 2s. 1d. The institution had lost the services of Mr. J. G. Jacob during the past year, owing to that gentleman's decease. To meet the increased demands upon the dental officers of the institution, the

Committee have made arrangements to add to the staff six honorary assistant dental surgeons, three of whom have already been appointed ; and they had also appointed an honorary demonstrator of operative dental surgery, the first holder of this office being Mr. Thomas Mansell, L.D.S.Edin. They also desired to express their appreciation of the services rendered as consulting surgeon for upwards of eight years by Dr. W. Mitchell Banks, F.R.C.S., &c., who had during the year resigned his office, in which he had been succeeded by Mr. Frank T. Paul, F.R.C.S. There was now a balance due to the Hon. Treasurer of £68 12s. 11d., which the Committee trusted the kindness of their friends and the public would at least enable them to diminish during the current year ; and they were also desirous of being placed in a position to pay off the balance of the mortgage debt, amounting to £450, on the premises, Mount Pleasant.

The CHAIRMAN proposed the adoption of the report, and that it should be printed and circulated, and in doing so said that if it were not for an institution of that kind being in the city, there would be a great deal more suffering than there was. Dental surgery had advanced now so much as almost to supersede Nature in regard to the making of artificial teeth, and if such was not the case life would often be insupportable. He trusted that the subscription list would be increased.

Alderman GRINDLEY seconded the motion, which was carried.

Dr. SHELDON moved, and Mr. RICHARDS seconded, the appointment of the officers for the institution for the ensuing year.

Dr. JOHNSON moved, and Mr. DAVID CAMPBELL seconded, several alterations in the rules, the one of most interest being that the apprentices of honorary dental surgeons should not have free attendance at the Dental Hospital as heretofore.

This was carried.

After the usual votes of thanks, the meeting terminated.

PHYSICIANS should no more prescribe a propriety mixture than a patient medicine. If their use were thus limited their manufacture would in a measure cease. Then, continues the *Cincinnati Medical and Dental Journal*, physicians would find in the rational applications of medicines to the particular indications of individual cases that their patients would do better, and that they themselves would have a more intelligent view of the treatment of diseases.

ON SECTION MAKING OF HARD TISSUES, ESPECIALLY OF THE TEETH.

(A Paper read at the Cambridge Meeting of the British Dental Association, and reprinted from the "Journal" of the Association,

By T. CHARTERS WHITE, M.R.C.S. and L.D.S.Eng.

It is not necessary to the making of a good dentist that he should be an accomplished histologist, any more than that an accomplished histologist should of necessity be an efficient dentist. But it may be necessary on many occasions that he should know of a ready and effective method of making sections of teeth when desirous of examining the internal structure of such abnormal specimens as now and again crop up in his practice; and by this I mean, not a simple slice, which may tell him anything or nothing, but such a section as will show him all and everything, regular and irregular, which a good section should show.

It is my desire in this short communication to give a few simple directions relative to what may be found in most text-books on histology, but, at the same time, to supplement them with some practical suggestions which I have found useful and which may be of utility to others likely to be called upon to make sections of hard tissues, but of the teeth in particular.

If we take any ordinary section of tooth purchased at a dealer's, unless it comes from a very expert and painstaking preparer, what do we see? Many times a specimen more or less transparent, with the tubular structure of the dentine obliterated, or if not entirely obliterated, covered by patches of translucency which mar the general appearance as well as detract from the perfect utility of the section; the edges may be fractured and jagged, presenting a very untidy appearance, and, taken altogether, but a meagre presentation of all the beautiful and instructive detail which characterises a well-made specimen. Even in those sections made with all care by ourselves, unless we adopt certain precautions, we may have all this detail present in the earlier stage of a section's existence, but be doomed to disappointment and annoyance in its examination after a year or two by the gradual disappearance of its tubular structure. It was this experience which induced me to adopt various expedients for obviating this annoying result, and although the subject of my paper may be considered by some as well-worn and as well threshed out, I am hopeful enough to feel

that, by describing the methods I adopt, I may be assisting my brother practitioners to attain results which may be regarded in after years with satisfaction. I wish to be very plain and practical, therefore if my communication appears somewhat of the character of the cookery book of recipes, I hope your pardon will be extended to me—cookery books, though not the highest class of literature, are, albeit, useful in their results and therefore not to be despised.

The text books, in treating of this subject, advise first that "thin slices should be cut from the tooth with a saw." Now, however desirable it may be to cut a tooth into as many sections as possible in order to be enabled to trace the various phases of structural change throughout its extent, I think I need not remind those who may have attempted it of the numbers of saws broken, to say nothing of those blunted and worn out in cutting through the enamel of one tooth, and if in the subsequent discussion, which I hope this subject will provoke, anyone will tell us a ready method of overcoming this difficulty, I for one will thank him heartily.

A lapidary's wheel has also been recommended for cutting the rough sections. This would cut but few sections out of many teeth, the number of sections depending upon the thickness of the wheel used, and furthermore very few of us possess lapidary wheels. With care, two or three sections may be cut from a tooth by first cutting through the enamel by wetting a new thin gold file with turpentine and soft soap, and then using a broad frame saw for cutting through the dentine. There is no difficulty after the enamel is passed. This may oftentimes be grooved by a thin corundum wheel on the lathe, and the section cut by the saw afterwards.

The plan I adopt may be a very wasteful one, but till we get a ready means of cutting through the enamel, I am afraid I must continue to recommend and to adopt it. I take a tooth and hold it against the side of a revolving fine corundum wheel (Ash's No. 9 fine) till one side is ground quite flat, then polish that side to the most perfect polish it is capable of receiving on a piece of wet buff leather with some putty powder on it; afterwards take a piece of stout plate glass about two inches square, put a little old and consequently tough Canada balsam on it warm, and spread it a little larger than your section. Let the balsam cool down till it is "tacky," then press the polished side of the tooth into close contact

with the glass. When quite cold, the grinding may proceed, as in the first part of the operation, till you get the required thinness, when that side may also be polished. The hard balsam round the section supporting and protecting the edges, they will not be fractured and made jagged and untidy. In not putting the tooth on to the plate of glass till the balsam is somewhat cool, you prevent the polished surface from being covered by fine cracks, which remind you of dinner plates which a careless cook has overheated till the glaze is cracked in all directions; it also prevents the balsam from running into the tubular structure of the dentine. As the process I adopt for mounting these sections is applicable to all sections of hard tissues, I shall reserve my remarks upon it till I have mentioned another plan of grinding down the rough slices, which I claim as original, and which I can from long experience recommend on account of its readiness, cleanliness, and the perfect parallelism of the sections produced by it. Having a slice of dental or other hard tissue of moderate thickness, place it between two plates of ground glass with water and a pinch of levigated pumice powder, and by a rotary motion of the upper glass gradually rub the section down till it is thin enough for examination with even the highest powers of the microscope. But towards the end of the process be careful to watch it, for as the glasses get closer together and the section thinner, one turn more of the upper glass will sometimes result in the total disappearance of an hour's work, and you will be eligible to take rank amongst beings of a very high order if an explosion of your private opinion does not occur. It is, however, better to avoid any such eruption, by using some of the older pieces of ground glass, which from repeated use have become rather polished and smooth. These may be employed with safety at this stage, because while they reduce slowly they also polish, and being more transparent than the new glass, you are enabled to watch the progress and stop the grinding in time to avert such an annoying accident as that to which I have just alluded.

Having ground your section sufficiently thin by either of the before mentioned plans, it remains to be mounted in a suitable medium for examination. Of all the media recommended, none fulfil the requirements in so satisfactory a manner as Canada balsam, if certain precautions are observed, of which I shall

speaking presently. Canada balsam is not, strictly speaking, soluble in alcohol, but is converted by it into a white pulverulent condition. Therefore the plate having the thin section attached to it, such as described in the first method of grinding, may be placed in alcohol, and after a few hours' soaking the thin section is easily detached without fracture, but will be found coated with this altered Canada balsam, every particle of which must be removed with a clean camel hair brush kept constantly wetted with spirit; unless this is done the section will look messy and muddled when it is mounted permanently. Having got it quite clean, it may, with the other which has been rubbed down between the glasses, be placed in clean absolute alcohol till you want to mount it.

It might be considered that all this camel hair pencil work might have been dispensed with by placing the section into some complete solvent of the balsam, such as chloroform, benzole or turpentine, but it must be remembered that by so doing we should bring about the very thing we have been striving to prevent. We want to mount our section without the highly refractive balsam running into the minute structure and rendering it invisible, and that is the reason I recommend this treatment by alcohol.

There are two good methods of mounting bone and teeth in Canada balsam, which, while securing the advantage we are desirous of attaining, also preserve in the highest degree the visibility of their histological details. That which I practise is the simpler. Take your section out of the absolute alcohol and let it dry, partially protecting it from dust or other contamination; when nearly dry give it a good soaking in filtered distilled water, that the tubular structure, or any minute spaces like lacuna or canaliculi may become filled with water; afterwards dry its surfaces by wiping them with a clean warm finger, so that all moisture is taken from them, when the section may be mounted in rather firm balsam with very little fear of structure being swallowed up in translucency. The reason blotting paper is not used for preliminary drying is that the fibres from it adhere to your section and disfigure its appearance. The second method is that practised by a scientific friend, who plunges his section for a moment into an alcoholic solution of white shellac, and quickly withdrawing it, the alcohol evaporates, leaving the porous structure completely occluded and protected from the balsam, however

liquid it might be. I think that both these methods are productive of such satisfactory results that I can commend them to your careful attention if you should at any time wish to preserve specimens of abnormal dental histology.

There is another method of making sections of the dental tissues which, though not practised on many occasions, yet demands our consideration for a short time before I close my paper, for it may be desirable in some cases to examine a recently extracted tooth with a view of ascertaining the state of the relationship existing between its dentinal tubuli and the pulp. These sections can only be made after decalcifying the tooth and hardening the pulp; there are many methods by which this may be accomplished. Picric acid in a saturated solution is often employed for this purpose, but for a ready solution that is generally to hand there is nothing so effectual as a saturated solution of common alum, with about half a drachm of hydrochloric acid added to each ounce of solution; steeping the tooth in this for about three weeks leaves the tooth with a consistency of cork, if it is now soaked in glycerine for a few days it may be imbedded and cut into thin sections by any of the usual microtomes. I prefer this to either picric or chromic acid, because it does not stain the hands, and I believe does not produce so much granularity as they do.

I have now reached the limit of the time allowed me and must thank you for your patient attention; at the same time I must ask your gentle criticisms on a paper which I feel is very short and far from exhaustive, but such as it is I launch it on your favour.

A FATAL CASE OF HÆMORRHAGE FOLLOWING TOOTH EXTRACTION.

By HENRY L. ALBERT, M.R.C.S., L.D.S.Eng., Dental Surgeon
to the West London Hospital.

THE following fatal case of hæmorrhage from tooth extraction occurred in St. George's Hospital, and was published in the *British Journal of Dental Science*:—

J. T., æt. 22, was admitted as an in-patient on October 9th, 1885, suffering from chronic synovitis of the right knee, the result of a blow. This progressed very satisfactorily, when he was seized with toothache. On the same day, December 28th, the dental assistant, in the absence of the dental surgeon, removed a carious

right lower first molar without difficulty. The hæmorrhage ceased a few minutes after the operation, but shortly after re-appeared so profusely that it was deemed advisable to plug the socket.

November 30th.—There is still much bleeding; patient pale and anæmic. Cavity plugged with bees-wax.

December 1st ordered—

Ext. Ergot. Liq.	...	...	...	...	℥xxx.
Aquæ	...	...	...	...	ʒj.

To be taken at once, and repeated every three hours. Besides this, oil of turpentine and tincture of the perchloride of iron were administered, the former being applied locally as well, but all failed in checking the bleeding,

December 3rd.—Patient weak; perchloride of iron, matico leaves, the actual cautery, and various preparations were all tried, and found ineffectual. There is a good deal of sloughing of the gums. Blood is welling up freely from the socket. Mr. Dent, one of the Surgeons to the Hospital, was sent for. Under ether an attempt to plug the socket with a piece of wood was made, but failed; the anterior wall of the alveolus was then broken away, and solid perchloride of iron inserted into the socket, a pledget of lint was placed on this, and a cork in the lint; the jaws were then bandaged together. The hæmorrhage recurred shortly after the operation. Mr. Dent saw the patient in the evening, and the plug was reapplied. At midnight the house-surgeon removed the cork and applied lint soaked in oil of turpentine. Hypodermic injections of morphia were given at 4.5 and 5.40 p.m.

Dec. 4th.—Early this morning the house-surgeon removed the plug and packed the cavity lightly with cotton wool soaked in Ruspini's styptic. Patient anæmic and sleepy from opium. Pulse full and regular. There has been but little hæmorrhage since this morning. In the evening the wound began to ooze, and about 10 p.m. the bleeding again became profuse. At 12 p.m. Messrs. Howard, Bennett and Dent met in consultation, and decided upon resorting to further operative measures. Patient placed under the influence of ether. Mr. Dent then made an incision in the middle line of the lower lip, and carried it forwards and to the right. The soft parts were then cleared from the bone, and the latter divided by a saw-cut passing through the tooth cavity; the canal for the inferior dental artery plugged on each side with wool; the divided

ends of the bone were not wired. The flap was replaced and secured with hare-lip pins.

Dec. 5th.—About three hours after the operation considerable hæmorrhage took place from the wound. Dressings and hare-lip pins removed, and the wound exposed to the air, and mopped with Ruspini's styptic. The bleeding gradually ceased, and at 10 a.m. the flaps were brought together with strapping. Patient waxy in appearance and cold. Pulse 144, soft and easily compressible. Respiration shallow. Later on the hæmorrhage recurred, and patient expired quietly at 8 p.m.

Hæmorrhage is a sequela of extraction which none can absolutely prognosticate. There are, however, certain indications which, though neither definite nor constant, may, when present, put the dentist on the *qui vive*. The appearance of the patient is often very striking—having fair hair, thin, transparent skin, with bright blue veins and pink cheeks. The pulse is full and rapid. Chronic synovitis is not a very reliable accompaniment of hæmophilia, though, as in this case, it is sometimes seen. The predisposition to bleed is often hereditary, usually through the mother. In this instance it came through the father, who (this was only found out shortly before he died, as he positively refused to tell anything of his family history till then) had succumbed to an attack of epistaxis. The patient himself had nearly bled to death on two occasions from epistaxis and a cut finger.

The treatment that arrested the hæmorrhage for the longest time has the local application of Ruspini's styptic. It stopped the bleeding when everything else had failed in a lad for whom I removed a lower molar root, and who bled, on and off, for eight days and nights afterwards.

I do not know of anything that was omitted in the way of treatment. Styptics too numerous to detail were tried. An attempt to stuff the cavity with plaster of Paris failed. On one occasion the patient was placed before the open window, with his mouth open, hoping the cold air would cause contraction of the capillaries, but with no beneficial result.

Stimulants were administered towards the end. The temperature on Dec. 3rd was 99·6° F., whilst shortly before death registered 102·6° F., steadily rising in the interval.

No post-mortem examination was made.

THE INTERNATIONAL MEDICAL CONGRESS.

IN an editorial article, the *Dental Cosmos* says:—It may be assumed that there are few engaged in the practice of medicine or dentistry but have learned of the proposed session of the International Medical Congress in Washington, in September, 1887; and it may also be assumed that it is almost universally known that inharmony, dissensions, even bitter antagonism, have been developed in the ranks of medical practitioners—an inharmony which seriously threatens, if indeed it does not insure, a partial and possibly a complete failure of the project.

It is scarcely worth while to occupy space in the attempt to explain the causes which have led to this much to be regretted state of things. The complications are such that it would be difficult, if not impossible, to present a *résumé* which would not provoke controversy. Suffice it to say that the differences seem to be irreconcilable, and a restoration of harmony, although confidently predicted, highly improbable.

The preliminary organization of the Congress included a Section of Dental and Oral Surgery, which after some vicissitudes was finally embraced in the permanent arrangements for the session. This result was not arrived at, however, without some elements of discord entering into the discussions; but of these again it is not necessary to speak. Nor could a statement of the causes producing this inharmony be framed which would not be considered partisan.

Passing by, therefore, all causes and matters of discontent, the question to be determined promptly and definitely is, whether under existing circumstances it is expedient to continue the effort for perfecting the organization of the Dental Section of the International Medical Congress of 1887.

The interval before the time assigned for the meeting is already so brief as to require prompt and harmonious action for a creditable presentation of dental science and art, and anything less than creditable would be emphatically discreditable.

Two courses are open, either the work should be taken hold of promptly, heartily, and unitedly, or it should be at once and definitely abandoned.

The first problem is, will the medical profession so adjust its

differences as to give reasonable assurance of the success of the Congress as a whole?

The next point to be settled is, will a sufficient number of leading men in dental practice combine to make a worthy presentation of the specialty?

There is one view to be taken of the situation deserving consideration. The great majority of the practitioners of dentistry are not medical men in the usual sense of the term. Forming in their affiliations and organizations a really distinct and separate body, it is competent for them to make a brilliant success of their Section which would be all the more luminous by contrast if the Congress as a whole should prove a failure.

But whatever is done should be done at once. Every dental society should take the first opportunity to record its decision in the dental journals, and thus a consensus of professional opinion could be had which would satisfactorily determine whether concerted action on the part of the dentists could be secured.

We would heartily favour the Dental Section provided it should have the united support of the leaders of dental thought. But with the influence of these thrown against the project, it would be worse than useless to hope for satisfactory results.

As an unbiassed recorder of facts, the *Dental Cosmos* is forced to the statement that, "under existing circumstances," the majority of the profession apparently deem it inexpedient to continue the effort for perfecting the organization of a Dental Section of the International Medical Congress. Such was the purport of a resolution adopted without a dissenting voice at an informal conference of some twenty leading dental practitioners at Buffalo, in November. At the recent anniversary of the First District Dental Society of New York the opportunity afforded at an entertainment given to the guests from other cities was availed of to take an informal vote on the question of "expediency." Out of about forty present, there were but two votes in favour of co-operation.

While like sentiments are expressed in private correspondence from all parts of the country, it is only fair to say that the current of opinion is not all in one direction. There are those who think the situation promising, and who express unlimited confidence in the success of the Congress as a whole, and in the Dental Section as a part.

It is due to those who have accepted position in the Congress that they be not left in doubt as to the intentions of the profession a day more than is necessary.

TESTIMONIAL TO MR. DAVID HEPBURN.

It has been proposed by several members of the Odonto-Chirurgical Society, and of the profession generally, to present Mr. David Hepburn, L.D.S.Eng., of Edinburgh, on the occasion of his retiring from practice, with a testimonial, as a token of their esteem for himself personally, and in recognition of valuable services rendered during a lengthened period in contributing to the advancement of the profession. The Committee consists of Dr. Smith, Dr. Reid, Mr. McGregor, Mr. W. Bowman Macleod, Mr. A. Wilson, Edinburgh; Mr. Biggs, Glasgow; and Mr. Campbell, Hon. Sec., Dundee. Contributors may remit their donations (not later than 15th February) to Mr. Walter Campbell.

Nearly £200 have already been subscribed.

JOURNALISTIC SUMMARY.

THE CINCINNATI MEDICAL AND DENTAL JOURNAL.

(January, CINCINNATI.)

"THE FAILURE OF FILLINGS." You (or any one of us), for instance, have an appointment for a two-hours' sitting with a man of business. Not without some inconvenience has he visited your office three or four times to have a space wedged where you suspect, or have actually discovered, extensive caries. As he seats himself he pulls out his watch and remarks, "Now, doctor, I have just exactly two hours to spare; don't detain me any longer if you can possibly help it." "Oh, no; I can easily do this in that time," you rashly promise, if you happen to be of the sanguine kind. So you apply the dam, and after much persuasive effort succeed in coaxing it past the frail cervical border of the cavity. You had previously opened the cavity with chisels, so that you thought you knew exactly what was to be done. Now you set to work to prepare the cervical border, first of all. What is the matter with this man's mouth, that you find it more difficult to get at an anterior cavity in a bicuspid than you have often found in reaching a posterior cavity in a second molar, for other patients? Props

assist you somewhat, but still it is awkward getting at that cavity. You proceed to prepare the cervical border, and at some point or other you are sure to encounter the danger of the instrument's cutting the dam, so you touch the cavity rather gingerly there, although you reflect that if you had plenty of time you would take off the dam and cut away vigorously right there, gum or no gum. But you think you can get along, on a pinch, and so you pack in the gold and pound it a little harder against that uncertain point, so as to be sure of no leakage.

This is one kind of failure. What was the matter with you—or this dentist, we mean—that he did not do exactly what his judgment dictated? He knew the work was not thorough. He should have frankly said to the patient, “I find that in order to prepare this cavity right I must remove the dam, or else spoil it which amounts to the same thing. By removing it I shall lose half an hour's time, but it must be done. I will then still have time to fill the tooth, but not to polish the filling. You must come again for that.”

Many a failure happens for the lack of a single instrument to reach some nearly inaccessible point. A good operator should always be willing to stop and consider, when he encounters the slightest uncertainty. The cotton or rubber wedge has not quite accomplished all you expect of it. The bit of nerve in a buccal root will not come out, although the dentist has spoiled a dozen broaches and a forenoon, in tinkering with it; that encroaching gum must be pushed back, that bit of nerve must be got out, before you proceed. That proposed groove or pit must be cut, hurt or no hurt, before you begin to fill.

These things are very trying. But the man who sets his face like a flint against proceeding with the second step until he is sure the first is well taken will, in the end, gain many patrons, although he at first lose many who lack patience.

It is well to let the patient know of these various contingencies before operating for him. Many failures are the result of a too accommodating disposition on the part of the dentist. Your patient lives in the country, and cannot come to town every day or two to have preliminary treatments made. The responsibility in this case rests upon the dentist of estimating approximately how many calls will be required and how much time for the final operations. To his conditions and terms the patient should be

required to conform, or the case should not be attempted. The woman who cannot possibly leave home and the baby to have her teeth filled will manage, somehow, to leave both, and spend four or five days at the county fair or a circus. The dentist has an unquestionable right to require his patients to furnish him proper conditions for attaining his standard.

Another cause of failure arises from using too large coverings of gutta-percha or similar non-conductors over nearly exposed pulps. It is usually difficult to pack gold solidly into a cavity two-thirds filled with a substance so elastic as to occasion a recoil of the instrument. Cement is better in this respect. Many a dentist has labored on, wasting more gold than he finally packs into the cavity, wondering why it will not adhere.

In active practice, the dentist must use careful judgment in arranging his appointments. He should so manage as to be sure of a good light and plenty of time for all difficult, tedious operations. To do this he may need to be somewhat arbitrary, but people will easily forgive and forget that, if the work be superior. Since good work imposes severe exactions upon the dentist, he in turn is compelled to impose exactions upon his patients. All these things tend to impress the public with the value of his services far more than an easy, slipshod, too accommodating disposition. Patients soon perceive that their dentist is fully alive to his responsibilities, and they will readily co-operate with him to secure the best results.

"PROFESSIONAL JEALOUSY." To feel no rancorous uprisings when a rival enters the field of one's professional labors, and diverts attention (not to say dollars) from oneself, is an indication of magnanimity such as few of us can claim to feel. It is at such a crisis that two or more professional men frequently set about, unwittingly, to undermine, not each the other's prospects, but each his own prospects, of gaining or retaining a hold on public sympathy and confidence. The new-comer has every advantage in opportunities he finds for criticizing the established rival's work, so he sets about by cunning inuendoes or open denunciation to undermine the confidence of his patrons in him. This comes to the ears of the established rival, and he retaliates by calling his slanderer a quack. It makes little difference which is the aggressor or which is the quack; the result is one and the same in the majority of instances, to-wit: injury to both participants. It

the charge of empiricism brought against the established dentist be true, his best rejoinder lies in a dignified silence; if it be false, a dignified silence is still his best defence. The assaulting party is, ten to one, the real quack; for it is usually either a consciousness of deficiency or else a selfish disregard of the right of others, that prompts a man to slanderously assail his competitors. Whatever be the impelling motive, the aggressor is fairly certain to compromise himself in the esteem of those he seeks to win. Assuming that the party attacked is competent in his profession and deserving of the confidence reposed in him, he has nothing to lose by keeping silent. The selfish, greedy, unscrupulous quack has certain advantages in dealing with credulous people, which it is not worth the while of honest, conscientious men to attempt to neutralize in any other way than by a counter example of honest faithful service toward all who give them preference.

But sometimes it happens that neither party to the controversy is a quack; one is simply more enterprising and energetic than the other. The new-comer, we will say, fits up an office in a style far surpassing any office in town, he joins a fashionable church, pushes himself into the best society, wears good clothes and makes more acquaintances in a week than his old established rival makes in a year. Presently it becomes noised about that he is really a superior dentist, and people flock to him and pay larger fees than any of the old established dentists ever thought of charging. The new dentist is perhaps aggressive only in the fact that he does better work than the other dentists. The whispering and back-biting usually comes from the other side. The older dentists are forced to swallow their resentment and mortification, and confess to themselves that they might profitably go to school to the new-comer. This is an extreme, instance we admit. The number of young practitioners whose attainments are sufficient to offset the advantages of longer experience, such as their elders can boast, is probably small. But the advent of such a man as the above described is apt to lead to a war of words, and recourse is had to means sometimes fair, but only too often foul, to overthrow the intruder. The inferior dentist perhaps sets about to advertise his incompetency by beginning a game of "cut-throat" and a general row ensues, in which each gets the other by the ears, and,—the public sits quietly, by waiting its opportunity to make the most possible of it.

PROSECUTION OF A DENTIST.

AT the Manchester Assizes last month, before Mr. Justice Day, an action was brought against Mr. James Jackson, Dentist, Burnley, in which the plaintiff, Mr. Robert Jackson, farmer, sought to recover damages for the alleged seduction of his daughter whilst under the influence of nitrous oxide. There was also a cross action for slander brought against the plaintiff. The trial occupied nearly three days.

HIS LORDSHIP, in summing up, said the one substantial issue for the jury was, did James Jackson, the dentist, or did he not, administer gas or some narcotic to the young woman, Margaret Ann Jackson, and did he, while she was under the influence of some anæsthetic, criminally assault her? That was the question they had to determine, and it was a question of the very gravest moment. The consequences to the one side or the other must necessarily be of the most serious character. The charge which was made against the dentist was one of assault under circumstances of the most aggravated and nefarious nature. The charge, on the other hand, of which the woman would be guilty, if she had made a false accusation, was one of the most wicked, odious, and vile that could be brought by one human being against another. The case was one of a most extraordinary character, and one which, he was happy to think, was very rarely raised in a court of justice. It was one which demanded at the hands of the jury, as he knew it would most assuredly receive, their deepest and most anxious attention, so that to the utmost of their ability they might do justice between the parties. He did not hesitate to say that the question was of an extremely difficult character, but it was one which he was confident the jury would, using their own good sense, solve to their thorough satisfaction; and if they did solve it to their satisfaction it should be satisfactory to all well-minded people. He would say nothing about damages, because it was unnecessary. The parties probably were none of them in a position to pay damages. That, however, was utterly unimportant, and should not affect the amount of damages. It was unnecessary for him to say a word about damages, because he should not venture to put any limit upon the damages which they might award to either one side or the other.

The jury retired to consult on the case, and after deliberating for three hours, returned to court and stated that there was no possibility of their coming to an agreement. The Judge thereupon discharged them.

GOSSIP.

THE usual monthly meeting of the Edinburgh Dental Students' Society was held on Friday evening, January 15th, the President, Mr. Cormack, in the chair. Mr. James Leslie Fraser read an interesting paper entitled "Gold Filling—Illustrated." He had prepared a number of well drawn diagrams, and, as his paper proceeded, passed round for inspection individual instruments he found most suitable in the preparation of cavities and the plugging of gold.

THE Edinburgh Dental Students held their second smoking concert on Saturday evening, January 16th, when over one hundred gentlemen were present, the meeting being presided over by Mr. James Leslie Fraser, L.D.S.Ed.

DR. J. R. DAY and Mr. Henry Davis have been appointed Anæsthetists to the National Dental Hospital, *vice* Mr. Tyrrell and Mr. Hewitt resigned.

MR. WHITEHOUSE, L.D.S.Edin., has been appointed by the Lambeth Board of Guardians Dental Surgeon to the Norwood Schools. Salary not less than £30 per annum.

JOHN HUMPHREYS, L.D.S.I., has been elected Professor of Dental Anatomy and Physiology at the Queen's College, Birmingham.

VON DR. AUGUST WEISTRAM maintains that the germ-cells arise, as far as their essential and characteristic substance is concerned, not at all out of the body of the individual, but direct from the parent germ-cell. According to this theory heredity depends upon the phenomenon of a substance of peculiar chemical and even more special molecular composition passing over from one generation to another—a portion of the specific germ plasma of the parent egg-cell is not used up in producing the offspring, but is reserved unchanged to produce the germ-cells of the following generation.

It is sometimes possible, says Dr. A. B. Thrasher, to abort acute nasal catarrh while yet in the initial dry stage by ten to twenty grains of Dover's powders at bed time after a hot bath and a glass of hot lemonade. Fifteen grains of quinine under the same conditions has at times seemed to act equally well.

MONTHLY STATEMENT of operations performed at the two Dental Hospitals in London and the Birmingham Dental Hospital, from December 1st to December 31st, 1885:—

	National.	London.	Birmingham
Number of Patients attended ...	<u>1,451</u>	<u>2,112</u>	<u>748</u>
Extractions { Children under 14 ...	372	264	} 540
Adults ...	505	745	
Under Nitrous Oxide	406	387	
Gold Stoppings ...	103	208	—
Other Stoppings ...	521	644	201
Advice and Scaling ...	327	160	—
Irregularities of the Teeth ...	280	139	—
Miscellaneous ...	<u>154</u>	<u>300</u>	<u>18</u>
Total...	<u>2,675</u>	<u>2,847</u>	<u>770</u>

Two works on Surgery by various authors, and edited by Mr. Christopher Heath and by Mr. Frederick Terves respectively, are announced for publication shortly. In the latter work, "A Manual of Surgery," the chapter on Dental Surgery will be from the pen of Mr. Henry Sewill; that on Diseases of the Mouth and Tongue, by Mr. Walter Whitehead; and Diseases of the Jaws, by Mr. Augustus Pepper.

THE Annual Dinner of the Past and Present Students of the Dental Hospital of London will be held on Saturday, February 27th, at the Holborn Restaurant, when the chair will be taken by Woodhouse Braine, Esq. Gentlemen, either now or formerly connected with the Hospital or Medical School, who may through inadvertance not have received special notice, and who desire to be present, are requested to communicate with the Dean at the Hospital.

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No. 3.

NOTES OF A CASE OF CLEFT PALATE.

By CHARLES W. GLASSINGTON, M.R.C.S., L.D.S.Edin.

*Anæsthetist to the National Dental Hospital and Lecturer on Dental Materia Medica
at the National Dental College.*

ALFRED B., æt. 13, and living at Swansea, was admitted to Westminster Hospital on September 30th, 1885. He had had cleft of both the hard and soft palates since birth, extending in the median line from the posterior third of the hard palate, through the soft, and dividing the uvula. The cleft was about $\frac{1}{4}$ -inch wide anteriorly, increasing to $\frac{3}{4}$ -inch at the back. When admitted the patient was fairly healthy, was rather small for his age and he has two brothers and one sister, who have no congenital defects whatever.

Twelve months previously the patient was operated upon by Mr. Cowell, the senior surgeon to the hospital, but the operation was not successful.

On October 13th, 1885, Mr. Cowell again operated. The patient's palate was painted with cocaine (10 per cent.), the edges pared and drawn together by five stitches. The patient bore the operation extremely well, and did not seem to suffer any pain.

On October 24th the stitches had nearly cut their way through the soft palate, and by the 26th entirely so, and it was deemed advisable not to operate again, but to place the case in the hands of the dental surgeon. The above notes have been sent to me from the hospital ward book. On November 3rd I first saw the patient, and took a model of the mouth, in order that I might make a proper impression tray. On examining his mouth I found it in the following condition. The cleft was about in the same state as described above. The two six year old molars in the upper jaw were decayed to the gum, so I extracted them, and all

the rest of the teeth were sound and in their proper positions, with the exception of the left central incisor, the cutting edge of which was only just through the gum, and twisted in an antero-posterior direction.

I made an ordinary impression tray with a prolongation at the back, and took the model in *Ar* composition. The parts at the back of the mouth were not at all sensitive, so I was able to hold the model in the mouth until it became thoroughly set, without any retching occurring. I had a plate of hard rubber made extending all round the teeth and fixed by a wire on each second bicuspid, although it hardly needed them, as the piece would have kept up by itself, and to this was pivoted the usual elastic velum. This I fitted in, and after an interval of three days saw the patient again, when there was a decided improvement in his speech. He then left for his home at Swansea, and I am to see him again in six months' time; and should there be anything worthy of communication in connection with the case, I would publish it.

The mechanical treatment of this cleft is of the ordinary kind; but the special interest in connection with the case is the fact of its being another of the similar instances already recorded, where congenital cleft palate only admits of mechanical rather than of surgical treatment.

SUPERNUMERARY TEETH.

By JASPER J. LAKEMAN, L.D.S.I.

IN last month's RECORD I read Mr. Forshaw's report headed SUPERNUMERARY TOOTH, and I therefore think that perhaps the following may be interesting to some of your many readers:

On January 13th a lady, aged 26, called on me complaining of pain between the upper right second molar and the wisdom tooth. Upon examination I found a fine specimen of a cubic-crowned supernumerary, which had become fully developed, on the labial side, and between the second molar and wisdom, partly displacing the former tooth. This my patient considered to be part of her molar tooth. She had a complete natural denture. After extracting the supernumerary she expressed herself free from pain. From this patient's mouth I, two years ago, extracted a supernumerary tooth, which was situated slightly behind and beside the second upper molar on the left hand side. Since that

time she has erupted the wisdom tooth. I have also at the present time a lady patient, aged 22, who has on the right upper, standing beyond and slightly towards the lingual edge of the gum past the second molar, a cubic-crowned supernumerary; this is not giving pain, and she has not cut the wisdom tooth on that side.

A PRESUMPTIVE DIAGNOSIS OF GOUT.

By J. MILNER FOTHERGILL, M.D.,

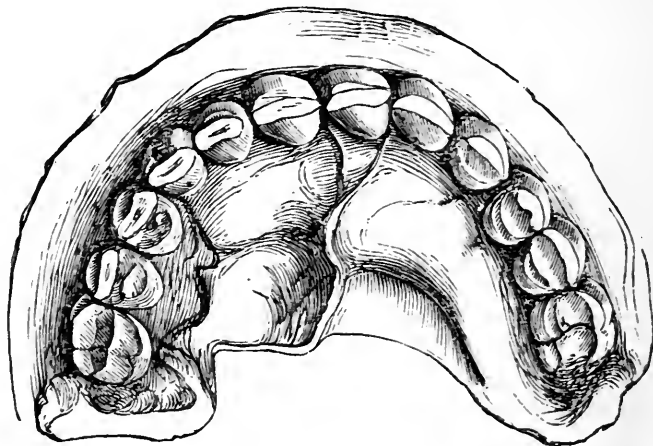
Physician to the City of London Hospital for Diseases of the Chest, Victoria Park.

OF the etiology of gout the author says that when the human liver becomes depressed, or rather degraded, it loses the power of (practically) complete conversion of nitrogenised waste into urea, and it forms a definite quantity of the primitive urinary product, as found in reptiles and birds,—viz., uric acid. When an abnormal quantity of uric acid is formed by the liver, then that person is “gouty” in the widest sense of the word. Gout, therefore, is hepatic reversion—the formation of a quantity of primitive urine-products by a mammalian liver.

There is little doubt that the configuration of the teeth has a distinct value. The teeth are solid, and, in the “Norse” type, massive. They are blunt and thick at the edges, and worn down. They have a great tendency to come out without any caries, but from an osteitis, extending from the neck along the fang to the root. Several of such teeth are attached to the card handed round. It will be seen that the incisor tooth is more worn down than the canine or molar teeth are. The centre of the tooth-surface is also of dark colour. When the gouty patient, on request, shows his or her teeth, their build and conformation are usually at once to be detected, while often the gum is seen retracted. Sometimes the front teeth of the upper jaw are very massive. The osteal growth along the fang of the canine tooth exhibited is very well marked. The teeth exhibited are not large, though they came from a massive gouty man of the “Norse” type. It is almost superfluous to say that these teeth did not trouble the dentist in their exodus from the jaw. Some years ago the subject of “gouty teeth” was mentioned by me at the Harveian Society, upon which Dr. William Stewart took casts of the teeth of a number of his undoubtedly gouty patients. He showed them before the Harveian

Society, when it was decided that the teeth did manifest more or less of the peculiarities just mentioned. By his courtesy I am enabled to exhibit these casts to you to-day, so that you can express your own opinion on the subject. One cast, showing the teeth in a comparatively early stage, I have had engraved (*see* Fig. 1). They are regular, well shaped, solid, if not large, teeth,

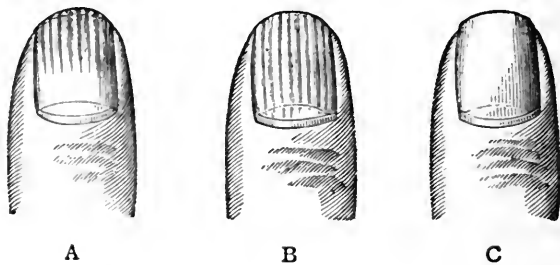
Fig. 1.



beginning to wear down distinctly on the surface. Such worn-down teeth, in my experience and opinion, belong to gouty persons.

Another matter is the nails. Sir Charles Scudamore long ago observed a peculiar hardness or brittleness of the nails of the gouty, so that it was difficult to keep them well trimmed. After some attention to the subject, I have come to the conclusion that the nails in gouty persons soon lose their smoothness, and become "reedy" or striated, showing the individual hairs of which the nail is built up. The photograph before you shows a "reedy" nail from a lady who is gouty (Fig. 2. A). The others (B and C)

Fig. 2.



have an interesting history. A gentleman present (Dr. Archibald) consulted me a year ago about his gout, for which I prescribed. After being put upon treatment, he observed the change in his nails. They lost their roughness and their reediness, and grew

perfectly smooth. When just half-way grown, the distal half being "reedy" while the proximal end was quite smooth, I had the thumb-nail photographed; and the difference is at once obvious. Later on, when the new nails were fully grown, another photograph (c) of the same nail was taken, and it will at once be seen that the nail is smooth and normal, and has lost its gouty characteristics. Not having a photograph of the nail (A) before the anti-gout treatment was adopted, a thumb-nail of a person of like age, and bearing a very close resemblance to it, has been taken in its place.

[The foregoing article is portion of a paper which was read before the Medical Society in November last, and we are indebted to Dr. Milner Fothergill for the use of the illustrations.—Ed. D. R.]

TRANSPLANTATION OF TEETH INTO ARTIFICIAL SOCKETS.

By W. J. YOUNGER, M.D.

HAVING referred to replantation and transplantation, the writer, in the *Pacific Medical and Surgical Journal*, January, 1886, goes on to express the difficulty he found in procuring teeth at the time they were needed for the latter operation. Recollecting that the experiments of John Hunter proved that teeth could be kept alive indefinitely by being grafted in cock's combs, he therein placed whatever good teeth or roots the exigencies of cases required to be extracted. On November 28th, 1882, a bicuspid which had been in a cock's comb for ten days was transferred to the mouth of a gentleman and became firmly fixed. Where he had not been able to procure a suitable tooth, a root had been taken and an artificial or natural crown mounted on it.

He continues :—I have also discovered that the pericementum can be kept alive for, certainly, two days, in warm water, temperature 100° to 110° Far. I have in two cases transplanted teeth successfully that had been so kept for fifty hours.

My former practice, when I found a root was too long or too wide for a socket, was to cut off from the apical extremity or shave off from the surface of the root the necessary quantity to insure a fit; but so often the best portion of the pericementum was in that way removed, that I tried deepening or widening the

cavity, as the case required, often cutting freely into the bone in order to save all possible of this valuable tissue. I found that adhesion took place in this portion as perfectly as in the unbroached. The consideration of this led me to the grand conclusion, that *artificial sockets could be drilled into the bone itself and teeth planted therein as successfully as into the natural cavities*. And again was I right.

On the 17th of June last, Miss Ward, æt 24, presented herself. She had lost the left superior lateral incisor, root and all, four years previously, and had been wearing, as a substitute, an artificial tooth on a rubber plate. The collapse of the gum, consequent on the absorption of the alveolus, was so great and the exposure of gum so much, in conversation, and especially in smiling, that the falsity of the denture was immediately recognised and was an object of great distress to her. As it was impossible, for the reasons just given, to produce an artificial substitute that would look natural, I determined upon the following operation—one that I had for a long time contemplated, and which, though satisfied in my mind, in consequence of certain observations and experiments, would be successful, seemed so opposed to scientific thought and the established rules of surgery, that I had not before screwed up my courage sufficiently to attempt it. I took a corresponding lateral from a young man, which, from its awkward position, was disfiguring his mouth, and prepared it as I do all teeth I use in transplantation, viz., removed the pulp, filled the pulp chamber and root canal with Hill's stopping, and finished the apex with gold. The tooth was then placed in water of the temperature of 100° to 110° Far., to cleanse it of all blood and impurities, and allowed to remain for about one hour. It was then placed in a bath of bichloride of mercury, 2 parts to 1,000 water, for about fifteen minutes, to disinfect it. The tooth being now ready, I turned my attention to the patient. I cut a hole in the gum a little less than the diameter of the root to be inserted. I then took an ordinary flat, angular-edged drill, and drilled into the bone in the line of direction the tooth was to occupy. When fully deep enough, I widened the cavity and formed the socket with a cone-shaped burr. When I found by trial that the cavity would receive the tooth perfectly, I carefully washed and sponged it out, in order to remove every particle of bone, first with warm water, then with cold, and lastly with the bichloride of mercury

solution already referred to; and when the bleeding had ceased, I introduced the tooth and kept it in position by delicate silk ligatures attached to the central incisor on the right, and to the canine on the left. There resulted a little swelling over the root, which remained a few days and then gradually disappeared.

An accident to the gum occurred during the development of its socket. Just as the drill touched the surface of the bone, the young lady jerked her head back, which caused the instrument to slip forward through the gum, making a triangular shaped gash of fully an eighth of an inch in length. Before the tooth was inserted, the edge of this cut was brought carefully together and retained in contact by delicate silk sutures. On the fourth day the sutures were removed, and no mark was apparent to tell of the lesion that had existed. In twelve days I removed the ligatures from the tooth and found it well attached. I then removed the threads to fix the tooth while the callus formed round the root. About three weeks afterwards, the gum being free from every sign of irritation and the tooth comparatively firm, and desiring to improve the position of the right superior central and lateral, I had to pass the ligatures around the new tooth. This, unfortunately, set up a slight inflammatory action, and an epulis formed a few days after, and a little discharge of matter took place. I thereupon removed the ligatures and treated with injections of iodine. When last seen the epulis had nearly disappeared, the surrounding gum had resumed its normal look, the tooth become firm in its position and performing its functions in common with its fellow teeth as though it had never been a stranger in the mouth.

This case was examined by several physicians, and by the members of the California State Dental Association, who, with the exception of two, pronounced the operation a great success. These two gentlemen were not thoroughly satisfied with its stability because, only, of the epulis that had been formed.

On the 15th of August and the 5th of September, similar operations were performed on Mrs. C., æt. 35. In Mrs. C's case, however, the teeth (superior bicuspid) had been absent for twenty years, and during this time she had worn an artificial plate.

On the first date mentioned, a socket was drilled out immediately on the right of the right superior canine and a bicuspid inserted. It was held in position by a silk thread attached to the canine and lateral in front, and a molar a little distance in the

rear, the thread simply passing over the crown between the cusps like a tight-rope.

On the 5th of September Mrs. C. being satisfied of the success of the operation, had two bicuspid inserted on the left side in a similar manner. In this case, however, there was no molar to attach a thread to, and so a little loose diseased root of a second molar had to be brought into requisition. Into this root a fine gold wire was inserted, to which the distal end of the string was attached, the string brought in and out over the crowns and between the cusps, and fastened to the canine and lateral in front. After the insertion of these teeth the face swelled slightly; there was no tendency to expel the teeth, nor was there any pain connected with them. The face was washed with the ordinary solution of muriate of ammonia in water and alcohol, and the gum painted with iodine. In four days the swelling subsided. The gums have now been for over two months without the slightest mark of irritation. The teeth have become quite firm, and the lady is now using them in mastication. There are three more teeth yet to be inserted—one right bicuspid and two left superior molars—which will be done as soon as the proper teeth are procured.

Mrs. C. herself says, "When I think that for twenty long years I have had to wear a nasty old plate, and now I have instead natural teeth growing in my mouth, I feel so happy that I cannot express myself."

In a later paper I hope, and expect, to discuss and prove to you my theory in regard to the method of attachment of the teeth in their natural as well as in the artificial socket, for I am confident that the views expressed in books and taught on this subject are erroneous, and thus prove theoretically, as well as I have practically, that teeth can be transplanted into artificial as well as natural sockets, and made to grow there, and be as perfect in appearance and utility as if they were the development of the very jaw itself, and that this can be a rule and not an exception.

THE Anniversary Dinner of the Licentiates in Dental Surgery, and Odonto-Chirurgical Society, will take place on Friday, the 12th day of March, in the Balmoral Hotel, Princes Street, Edinburgh. Mr. J. Rankine Brownlie, L.D.S.Eng., in the chair.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

THE ordinary monthly meeting was held on February 1st, MR. T. CHARTERS WHITE, M.R.C.S., L.D.S.Eng., President, in the chair.

MR. ARTHUR UNDERWOOD submitted for examination two cases of replantation. The patients were two girls about eleven years of age, and about fourteen months had elapsed since the operation. In one case a lateral and in the other a central had been extracted on account of irregularity, and immediately replaced. In each case the operation succeeded without a bad symptom; there was no tenderness after forty-eight hours, and the teeth soon became quite firm. The roots were not quite fully calcified.

He believed, and he would give his reasons for this belief, that these teeth had living pulps, and therefore that teeth, if only removed from their sockets for a short time and replaced, need not necessarily be devitalised. No one doubted that a replanted tooth regained a certain amount of vitality by means of the re-united periosteum, but most denied that the nervous and vascular connections of the pulp could be re-established through the apical foramen, asserting that this was impossible owing to the small size of the aperture. But as the process of union was microscopical, it was evident that the size of the foramen could not be an obstacle, whilst a consideration of what took place under similar circumstances in the case of other organs of the body rendered the statement he had made still more improbable. Thus, if a portion of skin was removed with its vessels and replaced, it would re-unite; so also a divided nerve would re-unite and its function be re-established. And if this could take place in other organs, why should it be impossible for the vessels and nerves of a tooth which had been extracted and replaced to re-unite?

He maintained that this had taken place in the cases now shown. If the pulp had died, the teeth would have become discoloured. This discoloration was due to a change in the contained blood, and since the tooth of a young person was more vascular than that of an old person, a greater amount of discoloration might have been expected in these patients on account of their youth. The discoloration was generally more marked after sudden death of the pulp than when this occurred after a period of disease. A marked change of colour might, therefore, have been

expected in these teeth; but instead of this their colour was exactly the same as the other teeth; it was impossible to detect the slightest difference. The sensibility to heat was also precisely the same; on touching them, or one of their neighbours, with a hot burnisher a sharp pain was immediately experienced, whilst in the case of a dead tooth the pain was only felt after an appreciable interval. This difference was noticeable also when cold applications were used, but it was not so marked as with hot.

But, by the permission of the President, he was enabled to submit the teeth to a further test. On darkening the room and applying a strong light behind the teeth, it would be seen that these were transparent,—that there was not the slightest difference in translucency between the replanted teeth and those which had not been interfered with. In order to show the difference, he had a patient present who had a dead tooth, and it would be noticed that it was decidedly less transparent than its neighbours,—presenting a cloudy appearance,—whilst a spot of caries was at once detected by its opacity.

The lamp he was about to use was one supplied by Messrs. Ash, the flame of which was enclosed in a metal chimney which had only one aperture admitting a narrow glass tube curved at the further end. The light travelled along this tube to its extremity, and could be directed at will upon any point in the mouth. It was fully equal, if not superior, in power to the electric light, being sufficiently powerful to render a tooth and even the alveolus fairly transparent, and was, owing to the entire absence of heat, very comfortable to the patient.

He would remark, in conclusion, that he was not an advocate of replantation, preferring torsion whenever this would answer the purpose; though in the case of laterals, owing to the flattened shape of the root, torsion could not usually be performed satisfactorily.

The patients having been brought in and examined,

MR. CHAS. TOMES said he had been told by Dr. Morrison, of St. Louis, that one of his assistants having replanted a tooth without removing the pulp, and afterwards feeling doubtful as to the result, drilled into it and found the pulp to be living. Mr. Underwood had suggested that the discoloration of dead teeth was due to staining by the altered blood of the pulp. He could only say, with reference to this, that the removal of the pulp did

not always prevent discoloration. Thus, a boy was brought to him who had had a front tooth knocked out some hours before, and had carried it about in his pocket. Mr. Tomes removed the pulp, which came out entire, the root not being quite fully calcified, filled the pulp cavity with oxychloride of zinc, and the apex of the canal with gold, and replanted the tooth. The operation was perfectly successful, except for the fact that the colour of the replanted tooth was far from being satisfactory.

MR. QUINBY (Liverpool) said he could give another case to show that colour was not a very reliable test. A tooth which had lain on a dusty road for three hours was replanted by a country doctor without any of the usual precautions. Nevertheless it became quite firm, kept its colour, and remained useful for six years. At the end of that time it began to be troublesome, and in spite of careful treatment had at last, nine years after the accident, to be extracted. A considerable portion of the root was then found to be absorbed.

DR. WALKER stated that fourteen years ago he extracted and replanted a lateral for a young lady; the tooth was erupted with the lingual surface forwards, and he reversed it. The result was perfectly successful; he had seen the patient quite recently; there was no difference whatever to be detected between the replanted tooth and its neighbours, and it was only by reference to his books that he could be assured as to which tooth it was.

MR. F. J. BENNETT said he found it difficult to believe Mr. Arthur Underwood's statement with regard to the re-establishment of the connections of the pulp without further proof. In his opinion none of the tests advanced by Mr. Underwood were conclusive. Certainly firmness was no test of vitality, nor was colour, and the temperature test was also very deceptive. He thought it possible, however, that in young patients the pulp cavity might become filled with some vascular substance, not true pulp, which would grow up through the large apical foramen.

DR. HARLAN (Chicago) showed a set of clamps for use in filling split bicuspid or molars. They were reversible, so as to be applicable to either upper or lower teeth.

MR. STOKES showed a set of rubber dam clamps made from his designs by Collins. Amongst them was a "universal clamp," designed to fit any molar; another had a saliva-ejecting tube attached.

MR. J. BLAND SUTTON, F.R.C.S., read a paper on

DENTAL AND ORAL CASES IN ANIMALS.

The object of the present communication is to bring under the notice of the Society a few examples of abnormalities and diseases of the teeth and mouth occurring in animals, and to offer a few remarks on some conclusions a study of the specimens suggests.

Growths.—Morbid growths in animals are not very common ; tumours of the oral cavity other than those caused by parasites are still rarer.

An interesting example occurred in an adult tiger, of fibrous epulides connected with the gums of the lower jaw. There were in all eight of these fibrous masses. One of them is closely associated with a tooth which has been imperfectly erupted, and its pedicle is intimately attached to the alveolo-dental membrane. Microscopically they seem to be overgrowths of the mucous membrane, with a large amount of exceedingly dense and tough fibrous tissue.

The general condition of the animal's teeth was very unsatisfactory, many of them being irregular in position, and some had their crowns partially embedded in the mucous membrane.

Epulis is a well-recognised affection in the horse, but, in addition to the tiger, I have only seen one other example in wild animals, and that was in a wolf.

The next case is of some interest in its bearing on the relation of irritation and tumour formation.

A young sheep's nose was surrounded by simple warts, agreeing in structure with those occurring on the hands of children ; and the hard palate had numerous warts sprouting from the ridges normally seen on the roof of the mouth of ruminants. A more critical examination showed that these warts were really overgrown papillæ, of which these transverse ridges are composed. In the same way numerous warts existed on the dorsum of the tongue, most of which were in connection with the lingual papillæ and the buccal fringes.

In addition to this condition of the mouth, there was a crop of exactly similar warts immediately above the hoof, at the spot known as the coronet.

The causation of these papillomata is somewhat curious. In this country farmers are in the habit of sowing clover among

wheat soon after the young blade has made its appearance. When the time arrives for cutting the corn, the clover is low and out of harm. The wheat is removed and allows the clover to grow, but the stubble remains. When sheep are turned on these clover fields they have to submit themselves, at least their nose and feet, to the constant irritation of the hard ends of the stubble. In many cases a crop of warts on the nose, mouth and coronet is the consequence.

This condition is not by any means rare, for I have heard of as many as fifty in a large flock presenting these papillomata. If the affected sheep be removed from the stubble their warts disappear.

Lambs' noses, like the hands of children, are very prone to develop warts, in consequence of their fondness for sticking them in dirty places.

Osteo-dentine.—It has been remarked by more than one writer on dental subjects that it is impossible to draw any sharp line of demarcation between the varieties of dentine, for they pass by insensible gradations one into the other, and it is often difficult to distinguish between some of the varieties and true bone.

It is more especially to osteo-dentine that I wish to draw attention. This substance is usually defined as dentine containing vascular canals, with a matrix disposed concentrically around them: lacunæ may be detected among the tubules.

So far as human teeth are concerned, osteo-dentine usually occurs as a pathological formation; but in many animals—the walrus, cetacea, and others—it is found occupying the pulp chamber under conditions not usually regarded as pathological.

It seems to me that the bare fact of the existence of osteo-dentine as a constituent of teeth, under certain conditions, is really the only reason for classing the material with dentine. Between bone and dentine a very wide distinction exists; dentine being a hard tissue pervaded in a regular manner by a system of tubules, containing fibrils of soft material. The dentine itself is the result of the activity of a layer of cells lining the pulp chamber and known as odontoblasts.

Bone, in its typical form, may be defined as a hard tissue permeated by vascular (Haversian) canals surrounded by lamellæ, containing in their midst numerous lacunæ which communicate

with each other by means of canaliculi. The hard part of the tissue results from the activity of living cells known as osteoblasts. But bone may arise in other ways, and by one method which, in connection with the subject in hand, is of some importance. It not infrequently happens that tracts of osseous tissue are met with in inflammatory formations, and in new growths, such as osteo-sarcomata, in which it is easy to determine that we have to deal with a deposit of granular calcareous matter in a homogeneous matrix. If the deposit is large and of long standing, the presence of lacunæ and canaliculi may be determined. A very common situation for the existence of such deposits is the choroid coat of old disused eyes.

If any one takes the trouble to compare under the microscope thin sections of bone from this situation with a piece of osteodentine, he will be unable to distinguish the one from the other.

Admitting the histological identity of the two tissues when fully formed, it becomes necessary to determine whether the mode of development in the two cases is identical.

I have been able to follow the matter with considerable detail in the following case: a young *Capybara* came into my hands, and on examining its teeth I was surprised to find that the layers of cementum, which normally bind together the plates of its compound molars, had softened to such a degree that the various parts could be separated like the leaves of a book; in this condition it presented a layer of enamel and of dentine of the ordinary density, succeeded by a layer of tissue resembling tough leather. Microscopical examination showed this soft tissue to be really decalcified cementum. On examining the molars carefully it was clear that one had to deal with normally formed cementum which had become decalcified, and not tissue in which the calcification had been arrested. The incisors were so soft in the parts below the gums that it was possible to mark them with one's finger-nail. On breaking them across they presented a curious porous, almost spongy, condition. The maxillæ seemed fairly normal, but the other parts of the skeleton bore evidence of disease,—the knee-joints were affected with pulpy degeneration of the synovial membrane, and the body geneally bore abundant evidence of malnutrition. Pieces of the incisors were slowly decalcified in a mixture of chromic and nitric acid, cut in sections, and stained in various ways. When examined under the microscope osteo-dentine could

be seen in various stages of development. The first thing to arrest attention in these specimens was the strong evidence afforded by the hæmatoxylin that many of the appearances were the result of inflammation. If sections of tissues which have been inflamed be stained with this material the inflamed portions stain more deeply and quickly than the normal tissue, hence it acts as an agent of differentiation. On examining sections of the capybara's teeth, islands and peninsulas of inflammatory tissue everywhere meet the eye, and dotted in them, in a way resembling cartilage cells, are tiny refractive calcareous granules. Beyond these patches of exudation the ordinary connective tissue of the pulp is seen. On examining a series of sections it was possible to trace the various stages from the normal connective tissue to patches homogeneous from exudation, to others sparkling with rounded refractive calcareous granules, and finally to others in which lacunæ and canaliculi could be discerned.

On comparing sections of so-called osteo-dentine with sections of bone from inflammatory new formations, I find it impossible to distinguish between them. This has led me to the conclusion that osteo-dentine is the result of ossification of the connective tissue of the pulp of the teeth: in very many cases it may be preceded by inflammation, but that event is by no means essential. Further, it is more closely allied to cementum than to dentine, from which it differs not only histologically, but also in the manner of its development.

If this view be correct, then osteo-dentine must be regarded as an imperfect variety of bone, and in no sense allied to dentine. This opinion is supported by the circumstance that in the teeth of odontocetes, walrus, &c., we have no evidence of inflammation, yet osteo-dentine is present in great abundance.

Curved Teeth.—Abnormally long and curved teeth in animals whose incisors and canines grow from persistent pulps are cases so well known that they have almost ceased to be of interest.

But the point which is of especial interest to me in these cases of curved teeth is, that all members of the pig family exhibit this tendency—the boar, the hippopotamus, the wart-hog, Red River hog, and babirussa. In a paper communicated to the Zoological Society in 1885 I endeavoured to show that the curiously curved canines so characteristic of the male babirussa, which have so long been a puzzle to naturalists, must be regarded in no other

light than a pathological condition which has become transmitted so as at length to become a racial character.

We see the earliest condition in the curved upper canine of the boar, the second or intermediate condition in the wart-hog, and the most exaggerated degree in the babirusa, besides occasional examples turning up in all members of the pig family.

Just a few words about the curving of the teeth. As to the cause of this, many opinions have been held, but it is of simple explanation. Mr. Smith Turner reminded me that when the stockbreeder wishes to make the horns of the cows curl he scrapes the inner sides with a piece of glass. As a consequence the horn curls towards the weakened side. This view is applicable to all the curved teeth I have examined, and especially to the circular teeth of the boars. The concave side of the curve always presents a worn surface where it has been played upon by the opposing tooth. Also in the case of the incisors of rodents, the constant wear of their posterior surfaces weakens them in that direction, and a curve results, of which the convexity looks outwards and the concavity towards the mouth.

This curving towards the weakened side is very well illustrated in an elephant's tusk (represented in diagram.) In which particular case it is probable that some defects existed in the tooth germ, leading to deficient formation of the dentine, causing the tusk to become twisted into a spiral. In all probability it is due to the transmission of some similar defect in the teeth of the ancestors of the narwhal, that causes the enormous tusks of these remarkable mammals to present the singular spiral twist so characteristic of them.

On other occasions I have exhibited before this Society examples of alveolar abscess in kangaroos, the result of injury to their long procumbent incisors. The following is an additional specimen:—

A *hypsiprymnus* broke the apices of its two lower incisors, and as a consequence an alveolar abscess formed in each maxilla. The abscess has induced serious changes in the surrounding bone, and on the right side has led to necrosis of the singular trenchant premolar so characteristic of this curious group of marsupials.

Both incisors have undergone necrosis, and the bone in the neighbourhood of the symphysis presents several cloacæ.

A study of these specimens, like others I have introduced to

this Society, further supports the opinion that diseases of the teeth are not entirely brought about by civilisation. When the subject has been more fully investigated with the care it deserves, we shall find that animals suffer from many dental affections to which man is happily a stranger; and although the possession of teeth is both a necessity and a privilege, nevertheless it has numerous disadvantages.

DISCUSSION.

The PRESIDENT remarked that members ought to be greatly obliged to Mr. Sutton for his very interesting series of papers. He believed that most of them knew very little about the oral diseases of animals until Mr. Sutton called their attention to the subject. Busy practitioners had few opportunities of reading up collateral subjects of this kind, but some of their patients were very omnivorous readers, and were apt to ask puzzling questions respecting matters which they, as members of a learned profession, might be expected to have some knowledge of. It was, therefore, a great advantage to be instructed by such a comparative anatomist as Mr. Sutton.

MR. CHAS. TOMES said it was always dangerous to criticise Mr. Sutton's papers on the spur of the moment, since he was not in the habit of making suggestions without having carefully considered the point discussed, and it was therefore desirable to have some opportunity for thought before venturing to question his conclusions.

But he (Mr. Tomes) was scarcely prepared to follow Mr. Sutton in his proposal to abolish one of the recognised dental tissues. The term osteo-dentine, as applied to pathological products of the pulp, might perhaps be abandoned without inconvenience, but he thought it would be decidedly inconvenient to abandon it altogether, especially as applied to such organs as the teeth of the pike. In these the tooth pulp first forms a thin external layer by the calcification of a surface layer of cells—odontoblasts, in fact; but the whole interior of the solid tooth—nine-tenths of it at least—is formed by a connective tissue calcification of the body of the pulp. Thus, whilst he agreed with Mr. Sutton that osteo-dentine was always a connective tissue calcification, whereas true dentine was a calcification of specialised surface cells, and that therefore it had much more in common

with bone than with dentine, yet he thought there would be more loss than gain in nomenclature if its use were abandoned altogether—at all events, for those teeth in which almost the whole of a specialized dental pulp became converted into it.

Mr. Sutton's suggestion as to the cause of the curling tooth of rodents and other animals was ingenious, and would account for the curling in many cases, but not in all. For instance, in the case of the widely curling tusks of the mastodon it was difficult to see where the attrition could come in as a factor in causing the curvature, seeing that there were no opposing teeth.

MR. F. J. BENNETT thought the curling of teeth could not be satisfactorily accounted for by the merely mechanical cause suggested by Mr. Sutton. The rule was that friction stimulated nutrition, and was attended by increased growth in that part. The curling of leaves was found to be due to more rapid growth of that surface which received the larger supply of nutrition, and he thought the curling of tusks must be the result of unequal growth due to a similar cause.

MR. STORER BENNETT also criticised Mr. Sutton's explanation of the curving of teeth, pointing out that the lower incisors of rodents did not get worn on the upper surface, though they curved in that direction; and, secondly, that these teeth were curved before they left the jaw-bone or met with any attrition. Nor did he believe in the pathological ancestor of the babirussa.

He had noticed in the Zoological Gardens a tiger which had a remarkable growth in the mouth which always became larger just before feeding time; the tumour looked as if it might be an enlarged salivary gland. He believed the animal died about three months ago; was this the one Mr. Sutton had referred to?

MR. SUTTON, in reply, said he agreed with Mr. Tomes that it would be inconvenient to do away with the term osteo-dentine, unless a better one could be suggested, and this he was not at present prepared to do. Nor did the name very much matter, so long as it was borne in mind that the tissue to which it was applied was a simple calcification of the connective tissue of the pulp, and differed entirely both in structure and origin from true dentine.

With reference to the objections which had been made to his suggestions as to the cause of the curling of certain teeth, he begged to be excused entering more fully into the subject at that

meeting, since this would necessitate his anticipating an important part of a lecture which he had to deliver on that day week at the Royal College of Surgeons, in which he proposed discussion of this question at some length.

The tiger referred to in his paper was one which had been presented to the Prince of Wales during his Indian tour. It had a warty growth on the lip, which the keeper informed him used to swell up at feeding time, but after death it appeared quite collapsed and unimportant.

The PRESIDENT then proceeded to deliver his

INAUGURAL ADDRESS.

Allow me to thank you for the honourable position in which, by your suffrages, I find myself placed this evening; but while I do this a sense of inadequacy rises within me when I remember the long list of well-known and highly appreciated predecessors who in the past have occupied this chair. While sensible of my inability to place myself on a level with those who may be justly regarded as the fathers of the profession in England, I claim to stand second to none in love for that special branch of surgery which we practise and they did so much to advance. In looking back down the long vista of my professional experience, it is gratifying to note the advances made by those who, going before, bore the burden and heat of the day; working in comparative isolation, and doing such good work that their names became familiar as household words in the mouths of all who were best qualified to appreciate and judge of it. Their appliances were comparatively crude, and their remedial agents few—it was not for them the barbed nerve extractor, the electro-magnet, and the burring engine with its multifarious bits—yet they triumphantly overcame difficulties which occasionally baffle us now.

It needs not the panegyric of an address like this to sing the praises of those who founded this Society: these live sufficiently in our surroundings.

I well remember the period when their honoured names could well-nigh be counted on the fingers of a man's hand. Their power as individual members of the profession was limited; few opportunities existed for their meeting in a corporate capacity and discussing matters of professional interest. When once the tide

of co-operation set in, that little cloud not bigger than a man's hand foreshadowed a mighty torrent of advancement, whose waves of improvement have not only resulted in the refinement of our surgical appliances, in the advance of our dental therapeutics, and the extension of our means of combating dental disease, but in fostering friendships far and wide, and in a Society like this adding daily to our mutual knowledge. The practitioners of the past, in forming this bond of union between us, laid the foundation for the furtherance of our knowledge—*they* laboured, and *we* have entered into their rest. I should qualify that word rest, as I refuse to accept finality in the path of progress. They have been, as it were, translated from the scenes of their early labours, and their mantle has fallen upon us; we are the trustees of that legacy they have left for those who follow, and it remains for us as a Society to fulfil that trust by carrying on the advance they started. It needs but a transient glance over the records of the Odontological Society to see how that trust has been carried out in the past. The valuable papers brought before us from time to time testify to the watchful interest its members take in all which relates to the practice of their profession, and their anxiety to extend this knowledge to the benefit of their suffering patients. But while there is much cause for congratulation, it is to be regretted that so many abstain through diffidence from coming forward to assist in a more constant supply of communications bearing on topics of general and daily practice. There are many subjects which need further light, and which have by no means received their ultimate illumination. Our newly acquired remedies need further use and observation, and their merits to be, by a species of collective investigation, well threshed out. Many of these remedies come before us with respectable credentials, but they require to be proved. Take our experience of the recently introduced cocaine and its application to dental hygiene. Judged by the notice we as a Society have given it, and by personal experience, it falls far short of what we had been led to expect from its character as a local anæsthetic serviceable in dental surgery. And it is only by our concentrated observation and frequent trials that we can glean from it all that is good, and reject that which is useless to us as a remedial agent.

In my own practice I have only found it truly of service in calming the intense pain which follows the extraction of a highly

inflamed tooth; but others may have experiences of a different character to bring forward, and casual communications embodying such experiences would be very acceptable, and would greatly conduce to our mutual advance.

Again, we have had in late years great additions to the antiseptic remedies employed in dental surgery. These remedies, as is well known to us all, are of great importance in the treatment of exposed pulp. Time was when creasote was about the only antiseptic agent in use for this purpose, but later researches have added to our "*armamentaria*" carbolic acid and its various relations, which I believe is an antiseptic agent not to be superseded. It possesses a capability of penetration into inaccessible sinuses beyond many other much vaunted remedies, and although many surgeons have a fear while they use it in severe operations lest carbolic poisoning should supervene, we use it in such small doses that no dread of mischance attends its employment. Moreover, its peculiar action upon an exposed pulp is favourable in many ways; the first application condenses the albuminous element of the surface and closes it against the entrance of putrescible germs; furthermore, it acts as a local anæsthetic on the nerves of the pulp during its destruction by escharotics. These qualifications, in addition to its antiseptic character, constitute it a most valuable addition to our dental therapeutics. Now, while we may be thoroughly satisfied with the results obtained through the instrumentality of this agent, the question still exists, can we find a better? Another antiseptic agent, the use of which has lately been advocated by Mr. John Wood, deserves careful trial at our hands. Being so recently introduced I have not been able to test its capabilities to the utmost, but coming as the recommendation does from one who bears such a well-deserved reputation for surgical skill and analytical observation, it will doubtless prove of as great utility in our hands as it has in his, while it will be free from many of the objections attached to carbolic acid. Peroxide of hydrogen, according to Mr. John Wood, is one of the most powerful microbicides known. He says in his recent Bradshaw lecture on Antiseptics in Surgery: "So small a proportion as one part in 2,000 is efficacious in preventing the beginnings of putrefactive fermentation, and destroying the activity and propagation of bacteria and micrococci of all kinds. It is absolutely innocuous, and is quite free from any suspicion of local or constitutional irri-

tation." Such a recommendation, coming from so good an authority, carries with it a strong desire to test its efficacy in the prevention of suppurative action in our treatment of exposed pulp and the cure of alveolar abscess. It is to be hoped this efficacy in dental surgery may be put to the test, and the results made known to us at some future time in a short paper. Antiseptics perform such an important *rôle* in the conservative surgery of the present day that every fresh one recommended to our notice should undergo the severest trial of its merits before being admitted to our fullest confidence, as many such, after having been weighed in the balance of our experience, have been found sadly wanting. I feel strongly disposed to say that this peroxide of hydrogen will justify our expectations, and not be relegated to that limbo to which so many other much praised antiseptics have been consigned at last.

I would again suggest another subject to which our united and concentrated attention might be directed with a view to the elucidation of its cause and treatment. I mean that obscure disease, erosion of the teeth, or, as Hunter called it, "decay by denudation." We meet with it in practice almost as frequently as we do caries, but while we can by stopping a tooth arrest caries and save that tooth, erosion on the other hand goes on with a determination we can do little to check. Many theories have been advanced in explanation of its cause, but none upon which to found a firm basis for treatment. My own conviction on the subject, coupled with the evidence of patients themselves, leads me to infer that a gouty or rheumatic diathesis lies at the foundation of this disease—that the acid engendered in the system, exuding from the gums, attacks those parts of the teeth immediately contiguous and in combination with the friction of tongue, lips, and food, removes an infinitesimal portion every day. This opinion is strengthened by the small quantity of tartar coating the teeth in the neighbourhood of the erosions, and by the reddening of blue litmus paper placed in contact with the gums of the eroded teeth; but this is only a suggestion for the cause on my part. I think it is a subject worthy of united consideration, for in erosion we have a disease which up to the present time seems to defy all our powers of observation and treatment, and might therefore fitly furnish a subject for collective investigation by which we might

obtain data for the elucidation of its cause, and upon which we might ground its successful treatment.

I am not aware of anything approaching original investigation having been of recent years devoted to this disease, nor anything so full and complete, as the *résumé* of it given by our old and valued, though absent friend, Mr. Alfred Coleman, before the International Medical Congress in 1881, and to which I would direct your attention.

There are also many other obscure points in dental pathology to which attention might be directed with advantage to us all, and one is the cause of that premature decay of the first permanent molar common amongst children during the past forty years or so, and for which parents generally and anxiously require an explanation.

From occasional microscopical examination of such of these teeth as I have removed in an early stage of decay, I am inclined to attribute one cause of it to an apparent want of fusion between the advancing centres of calcification of the enamel, an arrest of development leaving pipe-like fissures in the masticating surfaces which become foci of chemical action from the fermentation of food squeezed into them. But in addition to this malformation there is an appearance of general weakness in such teeth which can only be accounted for on the hypothesis of some disturbing influence during an early period in the life of the child interfering with the normal development of this particular tooth, sometimes in conjunction with that of the incisor teeth; but as this peculiar disturbing influence affects the majority of the children who come under our notice, it becomes very desirable that we should investigate its history, and, if possible, trace the evil to its source.

But I need not occupy the time of this meeting by multiplying these suggestions towards further investigations. I can only state that as former occupants of this chair have always stretched out a warm hand of welcome to any of the members of this Society who have come forward to give us the benefit of their experience, this year shall not form an exception. We have from time to time received valuable information from many outside the boundaries of our specialty, and while we have been deeply absorbed in listening to their interesting and instructive papers, we have been precluded from taking any active part in the discussion of them by reason of their subjects not coming within

the scope of our daily experience. Such communications will always receive that attention their high merits deserve, and their authors will always be thankfully appreciated, but we feel that more papers should come from within our ranks. We number amongst us men of high educational attainments, and we are justified in expecting from them, if they strictly fulfil their mission as members of a Society, a fair contribution now and again as the result of their thoughtful investigations, and bearing, as these would probably do, on the work of our daily lives, they would be discussed, not to our benefit alone, but for that also of those who seek our professional aid. I leave the consideration of these suggestions to the willing hands and hearts of our younger brethren in this Society—to those who have the energy and vigour and probably the leisure of youth. The greatest advances in a State may be confidently looked for in that *via media* between the vigorous impulse of youth and the mature restraint of age, and our younger brethren may confidently rely upon being listened to by their elders here with that attentive interest which has always been evinced in the subjects so brought before them, and in the subsequent discussion the mature judgment of older practitioners will correct where necessary, but not with unkindness. It does not speak well for any Society where the burden of finding a supply of communications is thrown upon the executive, and where the members are content to play the *rôle* of lay figures to make up an audience, and I sincerely hope that that diffidence which is so closely associated with this state of affairs may be dissipated as dew before the rising day, and that those who now retire behind this cloud may emerge to aid us in our desire to still further advance the scientific boundaries of our professional practice. Before resuming my seat let me again thank you for the honour you have done me in electing me to the dignity of being your President for the coming year.

MR. THOS. UNDERWOOD proposed a vote of thanks to the President for his very suggestive Address. As originally founded, the Society was intended to serve both political and scientific purposes. Its political work had been to a great extent accomplished, but as regards the scientific aspect the work before it was, as the President had pointed out, as interesting and as valuable as ever. Such being now the main object of the Society, it was a pleasure to see it presided over by one eminent in the

scientific world, especially in connection with microscopical science, and he looked forward to a prosperous year under Mr. White's guidance.

MR. ROBERT HEPBURN having seconded the motion, which was carried with much applause, the Society adjourned.

ODONTO-CHIRURGICAL SOCIETY.

THE Ordinary Meeting of the Society was held in Edinburgh, on the 11th February, Mr. W. BOWMAN MACLEOD, L.D.S.Edin., President in the chair.

At the conclusion of the formal business, Mr. MACGREGOR opened the discussion upon

THE TREATMENT OF THE TEETH OF CHILDREN UP TO THE AGE OF TWELVE.

He said,—I think the subject selected for to-night is a most important one, bearing, as it does, upon the health and happiness of the young. We all know, from sad experience, the amount of suffering the little ones who are brought to us endure, even at the earliest age, from the ravages of decay in their young and imperfectly formed teeth, and how incumbent it is for the dental surgeon to mitigate that as much as possible.

We are seldom called upon to treat the teeth of very young children, as that comes more within the province of the general medical practitioner. At the age of four or five, however, when caries has begun to appear, the young patients begin to make their appearance in our surgeries, calling aloud for us to give relief to their sufferings. Alas! how little can we often do, when even to look at the offending tooth is often sufficient to make them scream with terror.

The teeth which usually first begin to show signs of decay are the molars; they are, at least, those which give most trouble to the young patient, and which we are called upon to treat and, if possible, save. We all know how difficult it is for the young patients to allow the dentist even to look at the offending tooth, far less to be allowed to apply remedies to mitigate their sufferings, and afterwards try to save it till shed.

The remedies in that case must often be of a very temporary nature, mainly to give relief, and, in many instances, must be

applied by the parents of the child. In superficial decay, when teeth cannot be stopped, Mr. Coleman advocates the application of a few drops of a mixture of sal volatile and alcohol after each meal to the decayed tooth, which, he considers, has often powers of arresting the decay until the teeth are shed. When we have caries in the crowns of molars, and can get the patient to submit to an operation, we can preserve the teeth with an amalgam stopping, so as not likely to give further trouble. In interstitial decay, however, and when the pulp is exposed, we, to a great extent, must temporise, dressing with carbolic acid, carbolised resin, and other remedies. When the tooth has been brought to a condition to admit of a stopping, one of Hill's, or one of the cements, may be inserted so as to give relief for a time. We must always remember the importance of retaining the temporary teeth as long as possible. A good thing to do when the young patients are brought to us is to impress on the parents the importance of thorough cleanliness in their children's teeth, and use the tooth brush at least every day. What is of still greater importance is the proper attention to diet and exercise. Many of the parents at the present day have given over the good old custom of giving porridge and milk to their children and substituted tea instead, not to the advantage of the teeth by any means.

The next teeth we are called upon to attend to are those which have caused more controversy in the profession than any of the others—namely, the six-year-old molar. What are we to do with them? We often find them constitutionally so weak that no sooner are they erupted than they show signs of decay.

Those teeth are often considerably decayed before the patient is brought to us, often from the mistaken belief of the {parents that they are temporary teeth, and that they will get new ones in their place. When it is at all possible to save them, I consider it advisable to do so, as we often find that when they are much decayed, the temporary molars are in much the same condition. And when that is the case, I consider it essential to retain them until, at least, about the period of the eruption of the twelve-year-old molars, when we may consider the advisability of extracting them.

The stopping I find most suitable for the six-year-old molars, when the pulp is not exposed, is one of the copper amalgams.

The chemical action, resulting from their use, has a preservative effect on the action of the teeth, and tends to arrest decay ; and we often find that where it has been used the tooth has been left in a very satisfactory condition for many years. When the pulps are exposed, we can, by judicious treatment, put them in a condition to be stopped with one of the cements, and so retain them as useful factors for mastication.

I now pass on to the incisor teeth. They are those which will require all our skill to save. Decay may have extended in them to a very considerable extent before the patient is brought to us ; and especially so when there has been no systematic inspection. What are we to do to save them ? It is often out of the question to attempt to insert a permanent stopping in them at that early age ; all we can do is to put in a filling, which will preserve the teeth until the age of sixteen or so, when we can insert gold, or an amalgam if the patient is not in a position to pay for the more expensive stopping.

We often find the oral fluid, when in a vitiated condition, a most destructive agent in decay of the teeth, and when such is the case we must prescribe an alkaline mouth wash and tooth powder to try and counteract its action. The temporary stoppings I find most serviceable in the incisor teeth, in interstitial decay, is either Jacob's gutta percha or Weston's cement. These, used with care, will serve to arrest decay for a few years, until the patient is old enough to submit to a more permanent operation.

The bicuspid teeth will now very likely require our attention. Where there is only a deep fissure upon the grinding surface, without any exposure of the pulp, they can be saved for many years with either soft gold foil or tin ; where interstitial decay existed, the same treatment will hold good as suggested for the incisors.

Lastly, we have to consider the irregularity of the teeth. I will only touch on those cases where it can be prevented by the use of the forceps.

When the permanent teeth are making their appearance in the front of the mouth, and we are required to remove some of the temporary incisor teeth, which are still in apposition, it is necessary to remember the importance of retaining the temporary canine teeth as long as possible, as irreparable mischief is often caused by their premature extraction, the laterals and bicuspid teeth,

in that case, often being in apposition before the appearance of the permanent canines. In such an instance as this, and if all the teeth are in sound condition, the extraction of the first bicuspid will allow the canine tooth to drop into the space thus gained, and so prevent what would otherwise have been both a deformity, and also a source of decay in the other teeth, from lateral pressure.

For those few desultory and imperfect remarks, I crave the indulgence of the Society. I have left untouched a few other points I might have mentioned, but, I trust, sufficient has been said to be the medium of a good discussion.

Mr. HEPBURN said it gave him very great pleasure to be present at the meeting that evening. He had listened with much interest to Mr. Macgregor's remarks in opening the subject brought before them for discussion. He thought they must be all of one mind in thinking it advisable they should do all in their power to retain the temporary teeth until the time when they would be cast off in the ordinary course of nature. To make this at all possible, one thing was essential, they must impress upon parents and those in charge of children the necessity for bringing them periodically to the dentist that they may have their teeth examined. Were this done they might be able to detect the first appearance of caries, and treat them effectually without a painful or prolonged operation, either of which decidedly lessen the chances of seeing that child again. Every effort should be made to win their confidence, and remove that dread and fear of the dentist which seems inherent in them. He had frequently put in very temporary fillings, and done very imperfect work, rather than give them pain or weary them at a first sitting. It was surprising how much they would allow you to do if you gained their confidence. He was averse to the extraction of the temporary teeth, except in cases where it could be shown to be absolutely required for the relief of pain, or to prevent irregularity in the permanent ones. He considered that their premature removal arrested the subsequent development of the alveoli, and so would narrow the entire arch. In this way they all knew that when a tooth was extracted, its successor, or the one next it, would move almost imperceptibly into the space thus made; whereas, if allowed to remain until the absorption of their roots, the permanent ones will present themselves in a position anterior to the temporary; and to retain them in this position

nature will (with the growing teeth) build up an external wall of alveolus, which will increase the entire arch and secure room for the larger teeth. With regard to the first permanent molars, he thought a great deal of valuable time was frequently wasted in vain efforts to save them. He did not remember that he had ever regretted extracting them, but he had often had cause to regret not having done so. Their removal made room for all the other teeth, and especially for the more easy eruption of the wisdom ones, which for want of space were often arrested in their progress to the surface by being caught under the distal shoulder of the second molar, where they were retained, it might be for years, covered by a flap of gum, under which the food worked, and, decomposing, caused the decay of the teeth, so that when fully erupted they were found useless. These, with room, would in all probability have developed into sound and healthy organs. Of course he would allow them to remain (if so far sound), and even prop them up, until such time as the more permanent ones were able to take upon them the duties of mastication, and articulate correctly with the other teeth. There was one other point which he thought they ought to urge upon parents and children, and that was the use of the tooth brush, which was a great conservator both of the temporary and permanent teeth. This practice of childhood became the habit of after-life, and would be found as necessary for comfort as the washing of the face and hands.

Mr. WILSON said he quite agreed with Mr. Macgregor as to the necessity of retaining as many of the temporary teeth in use as possible, and in the means to be employed to do so. Also, in the weeding-out of teeth whose sockets were the seats of frequent abscesses, as well as all necrosed roots. He was more especially anxious to preserve the upper canines and the second molars in both jaws, as their premature removal, in his opinion, involved a loss of space for the successional teeth.

It was surprising how many parents (and even medical men) regarded the first permanent molar as one of the temporary series, and so made no effort to save it till too late, a result which regular dental inspection would have prevented.

He considered it of very great importance that the permanent molars should be retained till the bicuspid were fairly in place, as, otherwise, the want of support to the lower jaw tended to the distortion of the bite, and to the throwing on the front teeth of an

amount of pressure they were, in few cases, fitted to bear, and so the uppers were drawn outward.

In his opinion, the best time to remove a hopeless first molar was just in advance of the eruption of the second, as there was then some chance of part of the space being gained by the bicuspid and front teeth; they could, at that age, always count on the movement forward of the other molars.

As to the advantage to be gained in the better development of the wisdom teeth, he did not place any faith in it; at the same time, with an easier eruption, they would most probably be in a better condition.

He had met with a good many cases in which, owing to the very early removal of the first lower permanent molar, the second bicuspid had erupted into the unoccupied space, and afterwards when the temporary molar was shed, a large space was left permanently between the two bicuspid.

As to regulating cases, he preferred delaying these requiring mechanical appliances to a later age, only treating those in which the upper incisors were caught by the lower ones, and those in which the upper incisors were caught by the lower ones, and those in which the removal of one or more teeth was all that was required to rectify them.

Mr. MACKINTOSH, in treating the temporary teeth when caries is established, said he used Sullivan's cement or extra plastic amalgam, also treating the first permanent molars in the same way, and capping the nerve pulp with gutta percha or fossiline when the caries was deep seated.

Except for decided crowding, he saved the first permanent molars, as sometimes the second molars were more defective in structure than the first, and the third molar might not appear at all.

He believed the first molars and second bicuspid were the most important masticators in the mouth.

When an anæsthetic was required for the extraction of the temporary teeth, he gave nitrous oxide gas in preference to chloroform.

Mr. WILSON said he decidedly preferred giving young patients chloroform when an anæsthetic had to be given.

Mr. E. A. CORMACK agreed with the foregoing speakers that it was of the utmost importance that frequent and regular visits

should be made by patients from an early age. With respect to this he thought that Dr. Cunningham's case record cards would be found of great use to the practitioner, as it afforded him a ready means of reference, and could by slight additions be made to show the condition of the mouth at different ages and under varying conditions of health. He considered that too little attention was paid to the condition of the oral mucous membrane. He had found much benefit result from frequent light brushing and the use of diluted sal volatile where the gums were swollen, vascular, and coated with thick, stringy, tenacious mucus. He used friction to promote healthy action, and sal volatile as a stimulant and antiacid.

Mr. AMOORE referred to Mr. Macgregor's remarks upon the treatment of exposed pulps in temporary teeth, and asked if he never employed arsenic to destroy them? In suitable cases where it was probable that the root was still well preserved, he had used it with success, though never attempting to fill the roots afterwards, as in a permanent tooth under similar circumstances. He remembered in reading Mr. Quinby's work, recently published, that the author was in the habit of treating teeth in this condition with arsenic, but never attempting to fill either root or tooth afterwards, but cutting the crown in such a manner as to allow the tongue to keep the cavity free from all lodgments of food. He had been rather struck by a statement made by that author, to the effect that during more than 25 years of practice he had never met with a case in which he considered premature extraction of the temporary teeth necessary. If an abscess was established upon the roots of a temporary tooth, he (Mr. A.) had usually found it necessary to extract, but, from all appearances, Mr. Quinby did not find it so, but simply opened up the cavity freely and made a clear exit of any gases or matter which might be forming, thus allowing them to escape into the mouth—a line of policy to be fairly questioned, as it kept the mouth in an unhealthy condition, and involved the risk of possible injury to the permanent successor.

Mr. Amoire had frequently noticed what was probably the common experience of all—that permanent teeth erupted a year or two before the usual time for their appearance were rarely strong, and soon exhibited signs of decay, while, on the other hand, those erupted later than usual were stronger and better. He had one or two notable instances of the latter in his mind,

of patients, with remarkably good sets of teeth, who had retained one or two of their temporary molars for some years subsequent to their usual period of disappearance.

The PRESIDENT said, with regard to the use of arsenic in temporary teeth, his own experience led him to believe that it was quite safe, providing proper precautions were taken; that it served a useful temporary purpose, but that sooner or later abscess would follow, and the tooth require to be extracted.

Carbonate of soda was a most useful powder for children's teeth which were carious, and subject to slight aching after meals, and a small piece of common soda placed in a hollow tooth was a good remedy for toothache. The perfect administration of nitrous oxide for children under 9 or 10 years was extremely inconvenient, although not more dangerous than at any other age, and was occasionally accompanied by opisthotonos, at any age under puberty, a condition which ought not, however, to prevent the operator from proceeding with his work.

In his opinion, the extraction of the six-year-old molars should be symmetrical, and, if possible, delayed until the eruption of the bicuspid teeth.

Plastic fillings were best adapted for temporary teeth, and for permanent teeth, until such time as these were fully developed and matured.

On the subject of treatment of irregularities, he was at one with those who judiciously assisted and awaited natural developments; deferring the intervention of regulating plates or apparatus until the eruption of the second molars, except in some few cases, an example of which is given in the biting of the upper incisors within the arch of the lower incisors.

The President, in closing the conversation, said that although nothing absolutely new had been suggested in the treatment of the teeth of children between the ages of 4 and 12, yet there have been a few modifications of standard treatment advocated, which must add considerably to our resources when dealing with cases not amenable to the routine practice.

CASUAL COMMUNICATIONS.

Mr. MACLEOD exhibited a model of a case of Epulo-fibroid tumour in the lower jaw. The case was interesting, from the age of the patient, and owing to the cause of the tumour's growth.

The girl was between the age of 9 and 10, and had, six months previous, got a fall which broke the crowns of the first temporary molar and canine, on the left side. Portions of the roots of the temporary teeth had been left in, and the growth was apparently the consequence of the disturbance of the nutrition caused by the blow and the continuous irritation of the ragged edges of the retained roots. The tumour extended from the centre of the left lateral incisor to the second temporary molar, and was about an inch and a quarter long by three-quarters of an inch deep. The tumour was excised by Professor Chiene, at the Royal Infirmary, where the girl was a patient, and the case is progressing favourably.

Another model exhibited by Mr. Macleod showed a supernumerary central incisor. This model was accompanied by the normal central, left, and the supernumerary central teeth, which had been extracted. The crowns were large and well developed in both cases, but the roots were stunted, and in the case of the supernumerary tooth, was also twisted upon itself.

Mr. G. W. WATSON gave an account of the removal of an epulis by him from a patient, a female, aged 21. She was very anæmic and delicate looking, and complained of a growth in her mouth which was noticed first some five years ago. On examination, he found on the lingual surface of superior maxilla an elongated oval epuloid tumour, occupying the spaces between the central incisor (left) and the second pre-molar (right). It was pedunculated, the attachment being in the neighbourhood of the lateral incisor. Ulceration of the growth had taken place from the fact that the lower teeth bit into it on closure of jaws, causing a great deal of pain as well as preventing the patient from taking a proper amount of nourishment, thus accounting for the delicate appearance presented. He gave the patient a full dose of gas and removed the lateral incisor, which was slightly carious, and seizing the growth with a pair of artery forceps, cut it freely away; then using a bone gouge, he cut away a portion of the adjacent bone, and applied zinc chloride freely to the cut surfaces, and took the opportunity, at the same time, to remove the second pre-molar (left), which was abscessed and had caused a good deal of pain. The whole was managed, fortunately, before the patient regained consciousness.

The parts healed rapidly, and at present time, rather more

than two months since the operation, the mouth is in a perfectly healthy condition and the girl in first-rate health. On making a microscopic examination of sections of the tumour, he found it very soft in texture, and containing no bony spicules so common in such growths, its histological structure being fibro-plastic, with an unusual amount of myeloid cells present. He also remarked that it was from such cases, when there was a certain amount of irritation kept up, that a growth of this description would be liable to become purely myeloid in character if not removed at once.

Mr. E. A. CORMACK, in exhibiting the following four cases, stated that they had come under his notice since the reading of Mr. Edwards' paper, and it will be seen that in them all there is some peculiarity to be observed regarding the laterals.

No. 1. Model of the upper jaw of a gentleman, æt. 27. The mouth and teeth are well developed, but there is a space of about $\frac{1}{8}$ th of an inch between the central and the lateral incisors, on the left side. The patient believes this to be normal, but the deficiency of several lower bicuspid and molars may, by affecting the bite, serve as a clue as to the origin of the slight abnormality.

No. 2. Model of upper jaw, lady, æt. 25. The mouth and teeth well developed, canine suppressed on left side, lateral suppressed on right, otherwise teeth normal.

No. 3. Model of upper jaw, gentleman, æt. 26. Mouth and teeth well developed, with the exception of right and left laterals, which are rudimentary. An interesting point about this case is that, while his eldest brother has normal laterals, in his elder brother they are partially rudimentary, and in his sister, æt. 23, they are missing altogether.

No. 4. Model of an upper jaw, and teeth well developed. It shows two supernumerary laterals placed behind the normal laterals, which are also present. The canines are very prominent. The teeth being large and also numerous, give an extremely ferocious aspect to an otherwise placid countenance.

Another model shown by Mr. Cormack exhibited the effects of a blow from a golf-club on the backward swing.

The patient is a schoolboy, æt. 11. The right central is fractured across the neck, the left central has the mesial corner smashed off, while the crown is split from the cervix to the

cutting edge, dividing it into an anterior and a posterior portion, of which the latter is movable. The blow also damaged three lower incisors by removing a third of their substance from each.

Mr. WILSON exhibited two cases; in the first, an upper model, the second bicuspid on the right side was very much smaller than the first, while on the left it was much less marked. In the second model, a lower, the left second molar was of a very abnormal form (resembling a large second bicuspid); both the first and third molars were splendidly developed.

TESTIMONIAL TO MR. OAKLEY COLES.

THE presentation of a second testimonial to Mr. Oakley Coles took place on February 4th, at the house of Sir Edwin Saunders.

Many distinguished practitioners, both of Medicine, Surgery, and of Dental Surgery, were present, including Sir Edwin Saunders, Charles Vasey, Thomas A. Rogers, James Parkinson, Alfred Slate, Dr. Julius Althaus, A. J. Woodhouse, George W. Field, B. Longhurst, G. A. Ibbetson, W. F. Forsyth, S. J. Hutchinson, H. Royes Bell, Robert Hepburn, Murray Davis, Robert H. Woodhouse, Dr. Stephen Mackenzie, G. H. Bailey, Arthur Underwood, Thomas Underwood, J. Hughes Hemming, Dr. Joseph Walker, James Smith Turner, William Rose, Thomas Gaddes, David Hepburn, Dr. Felix Semon, F. Canton and Ernest Hart.

Letters expressive of regret at unavoidable absence had been received from Mr. Rymer (Croydon), Dr. Waite (Liverpool), Mr. Walter Campbell (Dundee), Dr. George Cunningham (Cambridge), and Mr. Dennant (Brighton).

Sir EDWIN SAUNDERS, in opening the proceedings, said:—Gentlemen, in the first place, let me express our thanks to you for your presence here to-day, which is highly appreciated both by the Committee and by the gentleman in whose honour we are assembled; by the Committee, because it affords them the opportunity of stating what they have been able to accomplish in fulfilment of your wishes in the short time at their disposal; and for my friend, I will venture to say, that this meeting will be a pleasant memory to him in the future; that your gift acquires an added value by the presence of so large an assemblage to-day. For it is not sufficient that we should have an appropriate testimonial on occasions like the present, the circumstances themselves

under which it is presented are perhaps of still greater importance; the cordial and gracious manner in which this is presented may make a deeper impression than the gift itself. An ideal testimonial presupposes a certain amount of intrinsic value, although not an excessive amount; but it is imperative that it should fulfil certain conditions; that it should be in conformity with the tastes of the recipient, that it should be helpful to him in his pursuits and in harmony with his daily life and surroundings.

How far these conditions have been observed—these ends attained—you will have an opportunity of hearing from our excellent friends, the Secretary and Treasurer.

When it became known that Mr. Oakley Coles was about to retire from the profession, I think it occurred simultaneously to several of his friends that the opportunity should not be lost to express in some tangible and formal manner our appreciation of his services to the dental profession. I am not here this evening to attempt to pronounce an eulogium on Mr. Oakley Coles, because, in the first place, I think he is too well known to every one present to make it necessary, even if it were desirable; and, in the second place, I do not think it would be in good taste. But having known Mr. Coles, I think for the whole period that he has been connected with the profession, I cannot refrain from stating certain things which have fallen within my own knowledge. He has for many years been a prominent and energetic member of the dental profession, and during that time he has so conducted himself, his demeanour towards his colleagues and fellow-practitioners has been such as to gather round him a large circle of friends. He has been a member of our Odontological Society, and he has not been a silent member, but a diligent and active one, taking part in its discussions and rendering written services that I need not particularly dwell upon. He has also been an active member of the Council, and if his name has not been found on the roll of past Presidents it is for one fault for which he is not responsible, viz., his youth, and of that he would have purged himself in time. He has been invaluable to that society as a good debater, not always assenting to theories or doctrines advanced, but not unfrequently helping to give vigour and interest to the proceedings by an uncompromising “no;” for the poet Cowper tells us

“We sometimes want the animated ‘no’

To make the stream of conversation flow.”

Sometimes by a very decided negative, and sometimes by a startling paradox, he has given new life to a languid or dull debate. He is also a member of the British Dental Association, of which he is a very active member, and to which he has contributed many valuable papers. He is an active supporter, and one of the founders, of the Benevolent Fund connected with that association. But the catalogue of what he has done would not be complete if I were to stop here, and therefore I will, if you will allow me, travel on, and will also say that he has been a most zealous worker for that most valuable institution, the National Dental Hospital and College, of which he was one of the surgeons and lecturers, and whose reputation, by his skill and assiduity, he has done much to sustain. I might give further instances of the good work he has done; still I think these constitute a pretty considerable claim and justification for what we have attempted to do. But should there be any cynical caviller who should ask—Is it always your practice to give a testimonial in such circumstances? or, Are there so few instances of men of talent or ability having retired from the profession? I would answer no. We have had rather a large experience of such cases, and I think I can recollect eight or ten men quitting our profession in middle life in which no such step has been taken. In those cases, however, retirement from the profession has been caused either by undue application to a laborious profession in early life, and in middle life it has been thought too great a penalty to pay to continue the strain by remaining in it; in other cases a man has had a long struggle in weak health, and has taken the first opportunity to retire upon a modest competency; and yet again retirement has been in some instances owing to a handsome legacy, such as to make the practitioner independent of any profession. But we have not had a retirement before, the object of which is, not to lead a life of inglorious ease, but to engage in work, and to undertake duties, not less onerous, not less exacting, than those to the discharge of which he has hitherto been devoted.

Well, gentlemen, I will not detain you any longer now, but will ask the Secretary to tell you what has been done, and reserve what I have to say further until a later stage.

Mr. VASEY and Mr. WILLIAM ROSE, Hon. Sec., stated that a hundred pounds had been subscribed; and, in accordance with

Mr. Coles' wish, fifty pounds had been expended in books, the balance in book-cases and an escritoire.

Sir EDWIN SAUNDERS, who was received with applause, said :—
Mr. Oakley Coles and Gentlemen,—There are few occasions in life at which we assist with more real and unalloyed pleasure than those on which we are drawn together, as we are drawn here to-day, to express our esteem and sympathy with one who has been associated with us in professional work through many long and not unfruitful years. In the present case, as Mr. Coles is about to part company with us, and to attach himself for the remainder of his life's journey to another band of pilgrims, and as, therefore, the occasion wears somewhat of a valedictory character, we would desire to add the expression of our good wishes for the realisation of all his aspirations in the new and onerous career, of which he has, doubtless after mature consideration of all the circumstances, deliberately resolved to make choice. And, in wishing him God-speed, I will, with your concurrence, greet him in the words of the old Roman poet : *Frater, ave atque Vale*. And reluctant, as we cannot but be, that our friend, who has so long and so worthily filled no inconspicuous place in our midst, should have been led to a decision which leaves that place vacant, yet we rejoice to know that it is not from disappointment, nor from want of success, nor from failure of health,—for he is still in middle life and full of mental and physical energy,—but simply from a conviction that he can be more useful in his day and generation, that his intellectual aptitudes, and mental and moral idiosyncrasy will have freer play and larger scope in the sacred calling of his adoption than in the profession in which he has hitherto been so favourably known. Nor can it be regarded as by any means an unusual or violent transition, for in the middle ages the Leech was to be found in the cloister, and the care of man's bodily health has never been deemed incompatible with that of his spiritual interests. Many examples of such an association of functions will readily recur to us all. More than one member of the Odontological Society, if I mistake not, combines occasional ministrations in the pulpit with the practice of his profession, and the vicar of a church in South Lambeth began life as a practitioner of Dental Surgery ; while a former dean of the dental hospital has also donned the sacerdotal robe in a typical and highly popular West-end church. Moreover, not to speak of others who have risen to eminence in the Church of

England, that original character, the Missionary Bishop Macdougall, was a member of the Royal College of Surgeons, and the late Bishop of Ripon was destined and qualified for the medical profession. But why seek to multiply precedents, for was not St. Luke himself a physician before he became an Evangelist? There is, therefore, no incongruity in this union of secular and spiritual interests; and, indeed, it may be questioned whether, especially in remote country districts, some knowledge of sanitary science and of the treatment of ordinary ailments might not prove a valuable addition to the more erudite and exegetical attainments of him who is the consecrated guardian of man's highest interests.

It is not for us, even if we could do so, to enquire too curiously into the hidden motives and the inner mental processes which have eventuated in this dedication to the service of the Temple on the part of our friend; but of one thing we may feel quite certain, that it was not with a view to worldly advancement, for he could not be unaware that his resolution must involve a sacrifice of income, though not of social position. For by that law of compensation which exists throughout the economy of the world, a very much larger amount of social consideration and of social influence is, by common consent, accorded to the sacred than to any other of the learned professions. The clergyman starts in life with a *cachet* of probity and respectability by virtue of his ordination, and, while the members of other professions are individually on their probation, their position in society being finally determined by their personal merits, the priestly office and the canonical vestments seem to be an all-sufficient passport to social favour. And by a tacit understanding, very much less is demanded in the way of hospitality and other claims of society from the clergy than from any other section of the human family.

In the absence, then, of any such subtle analysis of motive and processes of thought, as was given to the world in that charming and fascinating work, "*Apologia pro vita sua*," of Cardinal Newman, we, knowing his geniality, his philanthropy, his active mind full of resource, full of suggestion, are entitled to conclude that he will find ample reward and satisfaction in this, the work of his choice. To solace the afflicted, to reclaim the erring and fallen and bring them again within reach of human sympathy and a sense of divine compassion, to rekindle the dying embers of an expiring faith and trust in God's mercy under some crushing defeat

in life, or a heart-breaking bereavement, when the bruised and bleeding spirit seems to hunger for the balm of ghostly consolation; to take no unimportant part in the great events of life, in conferring sanctity on the mystic and sacred bond of conjugal love, in the consecration of each new life to the Christian church, and in the consignment to its native earth of all that is mortal of our personality, these are surely worthy aims and a destiny sufficiently lofty to satisfy a noble and chastened ambition.

" His theme divine,
His office sacred, his credentials clear,
By him the violated law speaks out
Its thunders ; and by him in strains as sweet
As angels use, the Gospel whispers peace."

May you, sir, long be spared to exercise these high functions, and by your edifying example, no less than by your spiritual ministrations, to diffuse light and happiness, and to inculcate temperance, industry, contentment and loving-kindness in the sphere in which you may be placed.

It now only remains for me, on behalf of some old and warm friends and colleagues (whose names will be found inscribed on this scroll), to beg your acceptance of a writing-table and of a book-case, stored with the lore of past generations as well as of some men of light and leading of our own time ; and, in doing so, we would cherish the hope that when, in after years, you may seek refreshment or inspiration from these mute but wise companions, you may sometimes bestow a passing thought on the friends and the scenes of a former phase of your life.

Mr. OAKLEY COLES, who was warmly received, said :—Sir Edwin Saunders and Gentlemen, you have heard that on certain occasions I have taken some part in debate, but on the present occasion I feel altogether unequal to the task that has come upon me, to express my appreciation of this handsome testimonial, and to reply to the very eloquent speech in which you, Sir Edwin, have made the presentation. A more generous and spontaneous indication of kindness than this I cannot imagine, and it is one that will do me good in every way ; it will give me confidence that as work has told in the past, so will it tell in the future.

Mr. Coles, continuing, said, that as various unauthentic reasons were given for the step he was taking, the present occasion afforded a good opportunity for setting speculation at rest. Some

people had wondered ; some had thought it folly ; some had thought it affectation ; and some had thought it unwise altogether. But in truth his decision was simply the product of the times. He was keen about the way in which things were moving ; he noted the spirit of the age and felt that men of experience in the work of the world might be of use in the Church ; men to combat the rising tide of infidelity and atheism, to realize this tide as a fact influencing all classes of society, and desiring to meet it in fair argument. He felt it incumbent upon him to give his *whole* time to this work ; he did not believe in doing things by *halves* with divided service, and having entered upon this work he felt he must do it entirely and not make it the occupation of his leisure. In order to get the ear of the working classes, he was of opinion that he must show that he wanted nothing from them, that he did not go into the Church as a means of livelihood, but that he claimed from the working classes only the sanctity of the right to labour in their midst. He enforced the necessity of a man's using his capabilities in every direction that was available, and regarded his own training as a dental surgeon—in the work at the hospitals ; the part he had been able to take in promoting, organising, or in any way furthering charities ; his connection with the learned societies, the exact method of investigation and scientific treatment of all questions which contact with the associations engendered—as a training which would be valuable and useful in the work which he was about to enter upon. It had been said that science and theology could not be made to agree, but he did not propose to make them agree ; it was not the business of his life to bring all laws into harmony, but to rejoice in the points in which they agree, rather than to speculate on those in which they differ.

He then referred to the nature of the testimonial, and said that those who had joined in making the gift had been especially kind in permitting him to exercise a choice as to the shape it should take. He dwelt upon the considerations which had induced him to select books. To combat error we should be acquainted with the details of it, and this had guided him in the choice of the 150 valuable volumes he had been allowed to gather together. Some strict theologians would perhaps view with disfavour the books he had chosen, which included works of criticism from Germany ; history and theology, chiefly obtained in our own country ; works of imagination for which France and the

earlier periods of the world's history were most famous. In his library would be found the writings of Auguste Comte and of Herbert Spencer, as well as of Paley and Bishop Butler, for in this way only could he be acquainted with all sides of thought, and be prepared to meet argument by argument. He then briefly touched upon his twenty-five years' connection with the dental profession, expressing his conviction that the past quarter of a century would be ever memorable in the annals of history for the advance made in all branches of science and thought, and not least for the progress that had marked their own profession; and he felt exceedingly glad to have lived in that period—exceedingly happy to have made the friendship of those whom he saw around him. And this generous gift would be a perpetual link between himself and his old friends, an enduring memento of their kindness and sympathy. He accepted it most gratefully as an appreciation of what he had attempted to do in the past—during a period which he might call his probation, for the sacred profession to which he hoped in time to attain.

The illuminated scroll read as follows:—

Testimonial to J. Oakley Coles, Esq., F.D.S., &c.

On the retirement of Mr. COLES from the Dental Profession, it was felt by his colleagues, his professional and other friends, that a fitting opportunity had arisen for making a direct and personal recognition of their appreciation of his professional labours, both as an original investigator and author and as a consistent and public spirited promoter of Dental Education and Progress.

For the attainment of this object the following Committee was formed:—

Sir Edwin Saunders, <i>Chairman</i> .	
Charles Vasey, Esq., <i>Treasurer</i> .	
Lord Alfred Paget.	Dr. Brodie Sewell.
H. Royes Bell, Esq.	Edward Bellamy, Esq.
Henry Smith, Esq.	Thos. Gaddes, Esq.
<i>Hon. Secs.</i>	
William Rose, Esq.	J. Smith Turner, Esq.

The sum of £100 was at once subscribed, and on Thursday, February 4th, 1886, an Escritoire and Collection of Books in two Book-cases were presented to Mr. Coles by the Chairman, in the presence of the subscribers whose names are here appended.

Althaus, Dr.	Field, Dr.	Mackenzie, Dr. S.	Slate, Alfred
Aveling, Dr. J. H.	Forsyth, W. T.	Mason, J. Brown	Smith, Henry
Bailey, G. H.	Gaddes, Thos.	Mills, J.	Tomes, Charles
Bell, The Misses	Halliday, M.	Paget, Lord Alfred	Tomes, John
Bell, H. Royes ;	Hart, Ernest	Patkinson, J.	Turner, J. S.
Bellamy, E.	Hemming, J. H.	Redman, J. H.	Underwood, A.
Brownlie, J. R.	Hepburn, D.	Rendle, R.	Underwood, Thos.
Campbell, W.	Hepburn, R.	Rogers, Thos. A.	Vasey, Charles
Canton, F.	Hugo, M. E. V.	Roose, Dr. R.	Waite, W. H.
Cole, J. F.	Hutchinson, S. J.	Rose, William	Walker, Dr.
Cormack, D.	Ibbetson, G.	Rose, jun., William	Wallis, C. J. Boyd
Crappier, J. S.	King, R. F. H.	Rymer, S. L.	Wanstall, E. P.
Cunningham, G.	Latchmore, E.	Sansom, Dr.	Whistler, Wm. McN.
Davis, Murray	Longhurst, B.	Saunders, Sir Edwin	Woodhouse, A. J.
Dennant, J.	McAdam, G. C.	Semon, Dr.	Woodhouse, R. H.
Down, Dr. Langdon	MacGregor, M.	Sewell, Dr. C. Brodie	Wormald, S.
English, Dr.	Mackenzie, Dr. Morell		

RADCLIFFE INFIRMARY, OXFORD.

At the Quarterly Court of Governors of this institution, held on January 27th, the Master of the University presiding, the question of appointing a dental surgeon to the Infirmary was brought forward.

Mr. SYMONDS proposed :—“(1), That a dental surgeon be added to the establishment of the Infirmary; (2), that the appointment be placed in the hands of the Electoral Committee; and (3), that in the event of their choice falling upon a gentleman duly qualified according to the rules, but not otherwise, he shall become a member of the staff of the Infirmary.” He remarked that the appointment of a dental surgeon he believed was agreed to be by everyone a most desirable thing for the good of the suffering poor generally. The appointment should be considered under the several heads for which it was of use. Firstly, the most practical way in which it came before them was that during the year there were on an average 365 teeth removed, and it was advisable that the most skilful method and recent appliances be employed with the result, obviously, of the least suffering to the patient. Secondly, a certain number of teeth might be saved by stopping, which previously had been unnecessarily removed. Thirdly, there were a few surgical diseases of the jaws from time to time in the hospital which might with advantage have the advice of a skilled dentist. Fourthly, as there was every possibility of a medical school being connected with the Infirmary, pupils should have good instruction in this branch of their profession. Fifthly, that as medical men, knowing how much more they could do by preventing diseases than directly curing them, and how many were materially caused by defective mastication, they might prevent those diseases by giving the poor patients artificial powers or enabling them to retain those teeth natural to them.

Mr. GEO. WARD seconded the motion, and did not see that any harm could be done by the addition of another member to the medical staff.

The Rev. J. DODD inquired whether this matter had been brought before the medical staff and the Committee of Management, and whether the gentleman appointed was to be a paid official?

The CHAIRMAN said the first question could be answered by the medical gentlemen in the room. As to the second it was a private

motion, and regarding the third there was not the least idea of the gentleman being a paid official.

Mr. WINKFIELD felt that it would be desirable to have a dental surgeon, but the delicate part of the question was whether he should have the full privilege of a member of the staff. The question was a big one and required consideration. In London hospitals it was the custom to have on the staff a dental surgeon, but in country hospitals the practice varied. In some of them the dentist was a member of the staff, and in others he was not. He did not feel that it would be fair to put on the same footing as the members of the staff, who gave considerable time to the place, and had much responsibility, a gentleman who would be only asked to come there a short time once or twice a week, and do work which could hardly be compared with that of the ordinary physician and surgeon.

Mr. THORNHILL considered that the question should be formally brought before the Committee of Management, who could report to the next Court whether it was or was not expedient to appoint a dental surgeon, and on what terms and conditions. He moved an amendment to that effect.

The Rev. J. DODD seconded.

The CHAIRMAN said the matter had already been carefully talked over by the Committee, who could not arrive at any conclusion.

Mr. GEO. WARD said he was Chairman of the Committee when the matter was discussed. The Committee were equally divided, and he did not give a casting vote, leaving it to the Governors to settle the question.

Dr. DARBISHIRE said the point they had to consider was whether they wanted a dentist. He agreed with Mr. Winkfield that it would not be fair to put a gentleman, who would be practically an out-patient surgeon, without beds in the hospital, on the same level as the other members of the staff.

Canon SLATTER feared that if a dentist were appointed, a vast number of persons would be attracted there who had no business to be relieved. On the other hand, he believed there were some cases in which persons had very serious dental maladies, which could not be taken in hand unless they became in-patients of some house.

Dr. COLLIER said the question to his mind was whether a

dentist was really necessary in a provincial town of the size of Oxford. Supposing they did make up their minds to make the appointment, then to have the work done properly they must appoint not one, but two or three men. He considered that this was the kind of work which a provident dispensary should take up.

Mr. MORGAN agreed with the other members of the staff, and thought it would be behaving rather unhandsomely to them to appoint a gentleman who had no stake in the house, and give him the same privileges as those who had a great deal of anxiety and responsibility, who were liable to be called up at all hours of the night, and could not leave Oxford for a week at a time without providing a substitute. He also thought it would be a great injustice to the dentists in the town.

Dr. BROOKS said that if they intended to put dentistry on the same footing as the other departments, then he should vote for the motion; but, if the gentleman appointed was only to carry out the duties at present discharged in the hospital, then he should vote against it.

Mr. UNDERHILL suggested that the medical staff should have power to call in a dentist when necessary.

Mr. W. WARD said that the whole question resolved itself into whether they really wanted a dentist.

The amendment was then put and rejected, and the first clause of the motion was carried by 14 to 7.

To the second clause Mr. Winkfield moved, and the Rev. J. Dodd seconded, an amendment to the effect that the election be in the hands of the Committee of Management.

This was lost by 11 to 10, and the second clause was adopted.

On the third clause the Rev. H. A. Harvey proposed an amendment that in no case should the dentist be a member of the staff.

A second amendment was proposed by Mr. Thornhill, and seconded by Mr. Rippon, "That it shall be left to the Committee of Management to define the position and duties of the dental surgeon when appointed."

Mr. Harvey's amendment was lost, and Mr. Thornhill's was carried.

This concluded the business, and the Court then rose.

Editorial.

DENTAL SURGEONS AT GENERAL HOSPITALS.

THERE can be no question of the propriety of appointing at least one dental surgeon to every hospital. The specialty is widely recognised as a distinct branch of Medicine. The special subjects of the dental curriculum form no part of the education of either the physician or the surgeon. The qualification of the dental surgeon is, in its broadest sense, not only one of collegiate education, but also of manipulative dexterity. These facts are acknowledged in every well appointed general hospital, whether in London or in the provinces.

However, many of the shining lights at Oxford have grave doubts as to the advisability of appointing a dental specialist to their infirmary ; and that, if a dentist were elected, he should occupy a sort of outside, half recognised position. The report of the meeting of the governors of Radcliffe Infirmary is published at page 139, and it serves to indicate how slow is the wave of progress even at a place noted for its learning. That hospital has 138 beds, and had 1,423 in-patients and 5,885 out-patients in 1884 ; whilst the population of the town is over 35,000. Fortunately, the governors have decided to have the services of a dental surgeon ; but the status that the new official has to hold has yet to be decided. There should not be any question as to the *locus standi* of the dentist to the institution, as there would not be of that of either the aurist or the ophthalmist.

If the dental department of a general hospital, such as the Radcliffe Infirmary at Oxford, were properly and efficiently conducted, there would be sufficient work to employ, for several hours in the week, more than one dentist. It is absurd to think of one individual, with justice to himself, faithfully fulfilling the necessities of conservative dental surgery in the practice of a charity like that referred to. Therefore the time and the laborious work that are required of him who holds an appointment of the kind merit a status in no wise lower than that of any other member of the staff.

The foregoing is something of what a dental department involves. To give the poor opportunity and facilities of obtaining the best skill in the treatment of their diseases and ailments, is the first object of a medical infirmary or hospital. Upon those who undertake the administration of such charities rests the responsibility of supplying the best services obtainable. Then why should the diseases of the teeth be treated by any one not specially trained? And why should that treatment be the crudest, and, in the majority of instances, most reprehensible—extraction only?

ANNOTATION.

MR. SPENCER BATE, F.R.S., has been particularly successful in his Valedictory Address as president of the Odontological Society. It has attracted the attention of the public press, and favourable comments have not been either meagre or few. The *Standard*, *Vanity Fair*, the *Western Morning News*, and other papers, have had either an article or a notice relating to some of the several points discussed. Reports of that nature are calculated to do a considerable amount of good, for the public is much in need of information of the kind.

GOSSIP.

MONTHLY STATEMENT of operations performed at the two Dental Hospitals in London, from January 1 to January 31, 1886:—

				National.		London.
Number of Patients attended	...	...	...	1367	...	2236
Extractions	{ Children under 14	...	...	318	...	323
	{ Adults	...	...	515	...	750
	{ Under Nitrous Oxide	...	...	458	...	460
Gold Stoppings	...	...	...	90	...	257
Other Stoppings	...	...	...	628	...	799
Advice and Scaling	...	...	...	318	...	141
Irregularities of the Teeth	...	...	...	269	...	128
Miscellaneous	...	...	...	151	...	429
Total	...	...	...	2747	...	3287

A SPECIAL appeal in behalf of the British Dental Association Benevolent Fund has just been issued. This fund has now been in existence since August, 1883, and has afforded relief to ten cases of great urgency; also seven orphan children are being fed, clothed, and educated. The fund is available for the succour of any necessitous and deserving registered dentist, his widow or children, and an annual subscription or donation, however small, will be thankfully received and acknowledged by the Hon. Treasurer, Mr. A. J. Woodhouse.

MR. WILLIAM J. MASON, L.D.S.Edin., has been appointed Surgeon Dentist to the Carlisle Dispensary, and Mr. William Palethorpe, L.D.S.Eng., House Surgeon to the Birmingham Dental Hospital.

THE Royal College of Surgeons of England received, during the past financial year, over £20,000 as fees from candidates; whilst nearly £10,000 was paid to the examiners.

THE relation between diseases of the teeth and the ears has been investigated by Dr. H. D. Burns, of New Orleans. Of 50 patients taken at random, 38 per cent. had bad teeth, 30 per cent. fair teeth, 18 per cent. good teeth, and 14 per cent. perfect teeth. In 19 out of the 50 cases the side on which the hearing was most defective was the side on which the teeth also were worse. While in certain cases diseased and painful teeth give rise to aural affections, on the other hand an inflamed ear frequently sets up intolerable toothache, even in sound teeth.

MR. JONATHAN HUTCHINSON believes that there is no reason to think that the transmission of syphilis is ever a thing of less or more, but rather that if a child inherits any taint it inherits the whole malady; the varying degrees of severity are to be explained in the same way as we explain the differences observed when scarlet fever is passing through a community. He adduces the hypothesis of M. Parrot that rickets is due to syphilis, and sees no reason why syphilis and rickets should not mix. The question as to whether deep ulcerations of the palate and pharynx, when met with in young persons, are usually due to syphilis or to scrofula, evidence pointed strongly to the conclusion, in Mr. Hutchinson's opinion, that syphilis was chiefly responsible for such ulcerations.

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No. 4.

COCAINE IN TOOTH EXTRACTION.

By the EDITOR.

THE remarkable properties of the alkaloid, Cocaine, have, practically, been brought prominently before the medical world only within the past eighteen months. The readers of the DENTAL RECORD have been kept *au courant* of the chief features of the literature on the subject. During last year it was very exceptional not to find in every medical periodical some mention made of the drug, and the pages of this journal have contained numerous articles and selections. In that manner has there been presented a sketch of the botany of the coca plant; a history of the medicinal properties of its leaves; an account of the introduction of the alkaloid, cocaine, as a local anæsthetic; of the physiological action of the drug, as far as has been made out, together with certain preparations and formulæ. In the July number (vol. v., p. 323), mention was first made of the hypodermic injection of a solution of cocaine for the painless extraction of teeth, painting the gum with it having been found to give but little relief.

Since then Mr. W. A. Hunt, L.R.C.P., &c., communicated to the January number of the *Journal of the British Dental Association* the successful results of his experience. He describes his *modus operandi* as follows: My hypodermic syringe has a capacity of nine minims; and is furnished with a steel needle; it is easily kept sharp with an oilstone, and is better than gold, which too easily becomes blunt. The syringe being filled with hot water, its contents are squirted into a small, short test-tube, at the bottom of which one grain of hydrochlorate of cocaine has been placed. If the salt shows no disposition to dissolve, you can heat the test tube gently over the spirit lamp until the solution is perfectly

clear; then dip in your syringe and take up four minims. Puncture the gum first on the buccal aspect about the centre of the tooth you propose to extract, pressing the needle as vertically as you can, so that its point may reach nearly as far as the apex of the root. The pain of the puncture is usually very slight, and is hardly regarded as the needle passes onwards. If the sloping surface of the point is turned towards the alveolus, there is less chance of the bone arresting the onward progress of the needle, and this is the chief difficulty in injecting. Having thrust the needle as far as needed, press the piston; often it will not yield even with force, but if you wait patiently, keeping up firm pressure and perhaps rotating the needle, or even withdrawing it a little, the solution will assuredly flow into the tissues. Keep the needle there half a minute, to prevent the possibility of any of the solution escaping by the puncture. Then re-charge your syringe with the four or five minims of the solution still remaining in the test-tube, and in a similar manner inject deeply the tissues on the lingual side of the tooth. It is remarkable how, when your patient is at the moment suffering from toothache, entire freedom from pain occurs in five or ten seconds after even the first injection.

You have now quickly and deeply injected a strong, hot solution of the agent; the conditions for rapid absorption are thus excellent, and in two minutes, or even less, you can operate with forceps, elevator, or splitting forceps, as may be required.

I have never injected less than a grain, but where the solution has flowed out through the puncture, of course there has been a waste of power.

As solutions of this agent do not keep, I have never used anything but a solution I have prepared myself immediately before the operation, as above described. If you cannot depend upon the accuracy of your chemist, use delicate scales and weigh the cocaine yourself. The grains may be folded in small papers separately, and put into a small stoppered bottle, so that no time may be wasted. I mention accuracy, as, if you take the trouble to weigh reputed grains, you will be astonished what different quantities they sometimes represent.

That the question of using a freshly prepared solution is not a fanciful one, is shown by the discussion at the late meeting of the Ophthalmological Society, where evidence was brought forward

by more than one member to prove the occurrence of irritation and inflammation after using solutions which had been kept for some time.

Now, with hypodermic injections, this is a danger that must never be lost sight of, and there is good reason for my bringing it forward. Likewise the syringe must be kept scrupulously clean, for it has often to be passed through tissues filled with the products of inflammation; so after use it should be very carefully wiped clean, and I then draw a few drops of liquid carbolic acid up and down the needle, and then wipe it dry.

My opinion is, that where there is much infiltration (by the products of inflammation) in the tissues, a slightly larger dose than a grain may be wisely given, and a minute or so more granted for time for absorption. . . . I have not observed as yet any constitutional symptoms follow this method, nor have I as yet found the injection to cause any local irritation.

Dr. D. W. Barker, writing in the *Independent Practitioner* (see also DENTAL RECORD, vol. v. p. 323), "On The Use of Cocaine by Hypodermic Injection for Extraction of Teeth," says—Complete insensibility to the pain of extraction may be produced by injecting, with an ordinary hypodermic syringe, five drops of a four per cent. solution under the gum, directly over the root of the tooth to be extracted. It will take from five to eight or nine minutes to get the full anæsthetic effect of the Cocaine. Pricking the gum to test its insensibility will indicate when to extract. The extent of insensibility is limited to a small space around the place of injection, and the effect lasts from ten to fifteen minutes, and then passes away.

An important fact to be kept in mind is that the agent is injected directly into the circulation of the patient; hence the drug and its solution should be the purest possible, and the instrument absolutely clean. In order that the solution may be of the best, it should be made of distilled water; all ordinary water contains some organic matter, and a solution made of it will sour in about a week and become not only unfit for use but positively dangerous.

In making the injection care must be taken to inject no air into the tissues; this may be avoided by drawing some of the solution into the syringe, then turning the point upward and expelling the liquid; any air in the syringe will go out first; then fill the syringe as full as required. To avoid running the point against the edge

of the alveolus, and also to avoid the thick and somewhat tough margin of the gum, let the point enter the gum an eighth of an inch from the margin, and, following the surface of the bone, pass in at least three-eighths of an inch; if the bevelled side of the point is held next the bone it will avoid sticking against it. Press on the piston rod gently and slowly, so as to expel the liquid a drop at a time; inject half of the five drops on one side (buccal or labial) of the tooth, and the remaining half on the other (palatine or lingual) side; hold the syringe point still for half a minute, and then withdraw it slowly, so that the liquid may be taken up by the tissues, and not spurt back when the point is withdrawn. For molars, injection may best be made horizontally, instead of vertically. If there are two or three roots standing close together the injection should be made midway between them.

I have been asked if the injection itself does not cause pain. If the gum is first bathed with the solution and the syringe needle is kept very sharp, there need be little cause for complaint. The wound always heals kindly and quickly, and there is never any swelling or pain, or any sign of local inflammation or systemic disturbance; the place where the injection is made causes no trouble, but heals with the rest of the wound, and all sign of it disappears.

My own experience fully bears out that of Mr. Hunt and of Dr. Barker. There is always a certain amount of the solution lost into the mouth in the act of injecting, so that of ten minims, having a grain of the alkaloid in solution, probably not more than two-thirds are injected into the tissues of the gum. In one case I took a grain and a half of cocaine, and added fifteen minims of water. A few drops were allowed to flow upon the gum of the upper jaw around the margins of the roots to be removed. After waiting about a minute, the needle was inserted along the buccal side of the first bicuspid, the point going to nearly on a level with the apex of the root, with scarcely any pain, forcing five minims out of the syringe, some of which entered an abscess sac. A similar quantity was injected into lingual gum, between second bicuspid and first molar, and the remaining five minims on the buccal aspect of gum, between first and second molars. After waiting about two minutes for absorption and the effects of the cocaine, I removed the roots of first and second bicuspids; the three roots of first molar; attempted the extraction of second molar, first

with root forceps, then with ordinary molar forceps, and again with root forceps, bringing away the two buccal roots together, and afterwards the palatine root. All this was done leisurely; the patient rinsed the mouth with water on three occasions, and yet the whole operation was, according to the girl's evidence and appearances, without pain. There being an immense abscess over the roots of the bicuspid, there was set free such a large quantity of blood and pus as to completely mask the roots behind. This was got rid of by washing the mouth as just mentioned, facilitating the remainder of the operation without marring the local anæsthesia. It is quite beyond possibility that I could have done so much with one administration of gas, or even gas and ether, and a second administration was, from the nature of the case, out of the question.

Cocaine hypodermically injected, as here set forth, is an immense boon to both patient and practitioner; to the latter especially, for ample time is given, which is not the case when nitrous oxide is administered, for the extraction of broken down and difficult teeth; at the same time, the patient, being conscious, can help in the work. The maximum anæsthetic effects are said to be observed between five and eight minutes after injection; the anæsthesia to last from ten to fifteen minutes, and then gradually disappear.

Until more is known of the constitutional effects of cocaine, it would be wiser not to indiscriminately inject several grains into one individual during the same day. It would appear that the alkaloid, when given to a certain extent, stimulates the sympathetic, increasing the heart's action and the blood pressure, with dilatation of the pupils. Among its toxic effects there have been noted sensations of coldness, paleness of the body, giddiness, uncertain gait, and a condition resembling alcoholic intoxication.

NEW REMEDIES.

By C. J. BOYD WALLIS, L.D.S. Eng., &c.

MR. T. CHRISTY, F.L.S., of the enterprising firm of Christy & Co., Drug Importers, Fenchurch Street, and author of "New Commercial Plants and Drugs," and others of the drug trade, are continually introducing new medicinal drugs and chemicals to the notice of the medical profession, and it is well for us to take note

of them, that we may glean from them those of special value as additions to our Dental *Materia Medica*, for some of these new remedies might be employed with advantage to a much greater extent than they are in dental surgery.

ACETATE OF ALUMINIUM is a valuable antiseptic and deodorant, that has been too much over-looked by the medical and dental professions, and this neglect is greatly due to the difficulty of preparing, at a low price, a perfectly neutral solution, and also to the fact that its value as a deodorizer of blood, used in the purification of sugar, was long kept a secret in the interests of sugar refiners. The value of the acetate for purposes of embalming was made known by Gammal in 1827; Burow, in 1857, called attention to its value for destroying the disagreeable odour of gangrenous wounds, and Professor Bruns confirms the statement, while Professor Bilbroth asserts its value as an antiseptic to be equal to that of carbolic acid. Dr. Brun states that during the twenty years in which he had treated wounds with the acetate, he had not seen a single death from pyæmia, even under the most disadvantageous conditions. Dr. A. Rose, of New York, strongly recommends it as an antiseptic and deodorant, and gives the following method of preparing it for medical purposes:—Ten parts of sulphate of aluminium are dissolved in the least possible quantity of hot water, and 17 parts of crystallized acetate of lead are added, also dissolved in hot water. The two solutions are then mixed. The sulphate of lead is allowed to settle, and the decanted supernatant liquid is treated with hydrogen sulphide, and after filtration, to remove the lead, it is warmed until the odour of the gas is driven off. The liquid is then diluted until it measures 48 parts. One ounce of the liquid should then contain a drachm of anhydrous acetate of aluminium. Thus prepared, it has a specific gravity of 1.0392. It can be obtained in the form of scales, soluble in water, in the same way as other scaled preparations.

Dr. Wilson, of Aix-la-Chapelle, employs acetate of aluminium in solution as a mouth wash during the administration of mercury in syphilitic diseases, and states that by its use salivation is prevented. He uses the following formula:—

℞	Acetate of Lead	...	...	...	...	240 grs.
	Powdered Alum	...	...	...	...	330 "
	Distilled Water	...	...	...	...	16 ozs.
	Aromatic or Peppermint Water	...	...	...	...	8 "

Dissolve the lead and alum salts separately in the water; mix and stir well together; either filter or allow the precipitate to settle, and decant the clear solution, to which add the aromatic or peppermint water. It may be used in a more diluted form if necessary, and the mouth should be regularly rinsed out from the beginning of the treatment to the end a dozen times a day, or even more, and in urgent cases during the night; if by any means salivation should occur, its ill effects are counterbalanced by the use of the aluminium wash. A 2 per cent. solution is said to be sufficient to permanently protect organic substances from putrefaction, and for purposes of irrigation a 1 or $\frac{1}{2}$ per cent. solution may be used.

I have prescribed the following formula, which I have found to be a most excellent mouth wash, and at the same time a useful preservative of anatomical specimens and other organic substances:—

R	Acetate of Aluminium	32	grs.
	Boric Acid	64	„
	Glycerine, pure	1	oz.
	Oil of Eucalyptol	10	m
	Engenol	6	„
	Eau de Cologne	1	oz.
	Chloroform Water	to 6	„
	Mix. This may be used as it is or diluted, as required.		

The next preparation to notice is IODOFORM: tri-iodomethane, CH I_3 .—This is not, strictly speaking, a new preparation, but a new process has been introduced by which an absolute iodoform—that is an absolutely pure product—is obtained by means of electrolysis. A sample has been supplied to me by Messrs. Zimmermann, agents in London for the manufacturers, Schering & Co., of Berlin. I regret that I have been unable to ascertain the exact method of the electrolytic process employed in its production. It is possibly a trade secret. But it is probably obtained by precipitation, by passing a constant current of electricity through a watery-alcoholic solution of iodide of potassium to which a uniform supply of carbonic acid is admitted; at any rate, chloroform, iodoform, and bromoform may be obtained by passing an electric current through a hot strong alcoholic solution of chloride, iodide, or bromide of potassium respectively, carbonic anhydride being simultaneously supplied.

In reference to the deodorization of iodoform, so many things

have been suggested for this purpose—notably, otto of rose, sanitas oil, tannic acid, Tonquin bean, balsam of Peru, and carbolic acid—but all of these are more or less failures; the most successful in my hands being carbolic acid, yet even this takes some few weeks to act before deodorization is complete. Dr. Putz, of Graefrath, says that he confines himself to oil of mirbane or nitrobenzol for this purpose, all other deodorants having failed in his hands. He uses six drops of nitrobenzol for every gram. of iodoform.

Coffee, a more perfect deodorizer than any of the foregoing, has been suggested by Dr. Oppler, and he has found that from 20 to 50 per cent. effectual for this purpose. It is said that coffee, when roasted, is an excellent application for wounds, and the effect is attributed to the presence of vegetable charcoal and to the aromatic empyreumatic compounds formed during the roasting process. A compound of 50 parts of iodoform and 25 parts of finely powdered coffee, triturated with a few drops of ether and then dried, will be found effective. A useful external application may be made by combining

Iodoform	...	...	...	...	...	1'00 grms.
Paraffin	...	...	...	...	...	10'00 "
Powdered Roasted Coffee	...	...	...	...	...	0'30 "

Mix.

The taste of castor oil may be disguised by combining—

Castor Oil	...	...	...	...	...	3 parts.
Powdered Roasted Coffee	...	...	...	...	...	1 "
Powdered Sugar	...	...	...	...	...	to taste.

Mix.

Other drugs of an unpleasant taste or odour may be combined in a similar manner.

IODOI: Tetraiodpyrrol, C_4I_4NH . — Another antiseptic has been more recently introduced and favourably reported upon by Dr. Mazzoni, of Rome; it is, I think, a preparation which we shall find of the greatest value in the practice of our specialty, for it has this great advantage over iodoform, that it is free from the unpleasant and penetrating odour of the latter, and it does not produce any symptoms of intoxication, while it contains about 90 per cent. of iodine, only 7 less than iodoform.

Iodol is a tetraiodpyrrol. Pyrrol is one of the constituents of animal oil, the distillate obtained by subjecting animal substances

containing protein bodies to destructive distillation. When this is freed from impurities and then precipitated by iodide of potassium, an iodine substitution product is obtained, namely, tetra-iodpyrrol, and this product has been called *Iodol*, for brevity's sake, by the discoverers, Drs. Silber and Ciamician, of Rome. Messrs. Kalle & Co., of Biebrich on the Rhine, are now manufacturing it on a large scale, and I suspect it will soon be as readily obtained through the usual channels as iodoform.

Iodol forms a light brownish micro-crystalline powder, free from taste, having a faint odour resembling thymol, and upon heating to a temperature of 100° C. iodine vapour is evolved. It is almost insoluble in water, moderately soluble in hot oil, freely soluble in ether, chloroform, and in three parts of alcohol; more soluble in absolute alcohol. It is not precipitated from an alcoholic solution by the addition of glycerine, but it is by the addition of water. Sulphuric acid dissolves it with a green colour, and nitric acid changes a heated alcoholic solution to a bright red. It possesses antiseptic properties similar to iodoform, exercises a local anæsthetic action, and greatly promotes the granulation of wounds.

NAPHTHOL.— β -Naphthol: Syn. naphthol alcohol. Naphthol is another important product; but it has been but little used in the dental surgery up to the present time, yet it is, I consider, second to neither of the foregoing in its value as a therapeutic agent in the treatment of the teeth. This preparation I have now employed for a considerable time, and I have found it invaluable as an antiseptic, disinfectant, and deodorant. It is especially as the latter that I have used it, and with the best results.

The preparation I employ is a pure re-sublimed β -naphthol. It is a derivative of coal-tar, and is in white shining laminar crystals, having an odour similar to storax. It has a sharp burning taste, and its powder excites violent sneezing. It is very soluble in ether, chloroform, and benzol; slightly soluble in hot water; soluble in an equal weight of alcohol, and in 1 part in 8 of olive oil and lard, and in 1 part in 80 of vaseline. It sublimes on heating, and may be distilled with steam, a property to be remembered when making hot solutions, or loss will occur.

Naphthols are compounds derived from naphthalin by the substitution of one molecule of hydroxyl (H.O.) in place of one of hydrogen. There are two naphthols, α and β (alpha and beta)

naphthol, so named for the purposes of distinction. They are respectively formed by fusing the two acids, alpha-naphthalin-sulphonic acid and beta-naphthalin-sulphonic acid, with alkalis, whereby hydroxyl is substituted for the sulphonic acid (HSO_3). α -naphthol is with difficulty soluble in hot water; easily soluble in alcohol and ether. β -naphthol, owing to the greater stability of the β -naphthalin-sulphonic acid, is more easily prepared, and it is this product that is generally sold in trade as naphthol. When pure, it is white, melts at 122°C ., boils at 286°C ., and on the addition of ferric-chloride its solution is changed to a greenish colour, while *white* di-naphthol is separated; and with the addition of ferric-chloride to an aqueous solution of α -naphthol, *violet* flakes of di-naphthol are thrown down.

Naphthol being odourless and colourless, gives it some advantages in the treatment of skin diseases, for which it has been successfully employed in advanced scabies, eczema, psoriasis, and for hyperidrosis, chronic ulcerations in ano, urinary fistula, abscesses, necrosis, &c.; it has also been used to disinfect rooms, for which it is excellent and specially suited, as it destroys all offensive odours, and not, I think, as some so-called disinfectants do, by overcoming a lesser odour with their stronger odour, but by chemical action; and for this purpose it may be sublimed by means of a spirit lamp placed beneath a dish containing the naphthol; the crystals of naphthol in minute subdivision are thus driven off by the heat, and penetrate every portion of the room, which becomes perfectly deodorized. If applied in solution (15 to 20 grains to a pint), it encourages healthy granulations in wounds, and stimulates the growth of new tissue.

The following compound is similar, but of a somewhat milder form, to that which I communicated to the *Lancet* some months ago. It is an invaluable, agreeable and refreshing application for fetid odours of the feet and body arising from excessive perspiration, wounds, &c.

The formula is as follows:—

R.	Naphthol resublimed	...	...	...	...	5 parts.
	Salicylic acid	...	...	...	...	5 "
	Boric acid	...	...	...	...	10 "
	French chalk, pure	...	...	...	...	80 "
	Engenol	...	...	...	...	5 "

Mix. Perfume if desired.

A useful formula for an external application for eczema, hyperidrosis of the hands, feet, &c., may be composed as follows :—

℞.	Naphthol resublimed	...	...	...	...	5 parts.
	Glycerine, pure	...	...	...	...	II „
	Engenol	...	...	...	...	4 „
	Alcohol	...	...	...	...	80 „

Mix.

This brings me to a compound which I have long used in the treatment of the teeth, and for the formula of which I have frequently been asked. It is as follows :—

℞.	Naphthol resublimed	...	...	...	..	3 iij.
	Iodol	...	...	...	...	3 j.
	Menthol	...	...	...	...	3ij.
	Carbolic acid, pure	...	...	...	...	3iv.
	Engenol and Eucalyptol aa	...	...	...	...	3ij.
	Chloroform, 3vj. ; absolute alcohol, ad. 3iij. Mix.					

For a permanent dressing for nerve canals I employ a similar preparation of a stronger character, made by the addition of another dram each of iodol and naphthol and two drams of gum sandarach.

This preparation, using until lately iodoform instead of iodol, I have found of the utmost value. It is at once a powerful antiseptic, disinfectant, and deodoriser, and an excellent application for a painful tooth. Space will not permit me to enter into an account of the experiments I have made with naphthol preparations upon teeth in the mouth and out of it ; but I may mention that I have filled nerve canals of extracted teeth with this preparation, and filled over it in the usual manner, and placed these teeth in various solutions and in human saliva for various periods of from three months to two years, and have then broken these teeth open at the end of the respective periods, and have found the dressing in every case perfectly sweet. I am of opinion that we have in naphthol the most durable and permanent antiseptic of all other preparations for the treatment of the teeth with which I am acquainted, with, perhaps, the one exception of cupric oxide, for it is not decomposed or rendered inert by contact with organic matter or the products of putrefaction.

HYDRONAPHTHOL.—In English and foreign journals attention has been recently called to this preparation which, it is said, occurs in commerce as a grey powder of a micaceous appearance,

having a faint odour resembling naphthaline. Dr. Fowler recommends it very strongly as an antiseptic; it is sparingly soluble in water, but dissolves freely in alcohol, ether, chloroform, and fixed oils. It has been described as belonging to the aromatic series, and bearing the same relation to the hypothetical radical naphthyl as carbolic acid does to phenyl. A saturated aqueous solution (viz., 1 in 1,000) is stated to be perfect in its inhibitory action, and to preserve animal tissues and liquids perfectly for an indefinite period, although producing no other perceptible effect upon living tissue than coating it with a slight film. It is said to be non-poisonous, non-irritant, and non-corrosive; having an antiseptic power second only to mercuric chloride, and ten times greater than carbolic acid. It fuses between 113° and 118° C., gives off vapour at 126° C., commences to sublime at 130° C., and sublimes all but a dark carbonaceous residue between 140° and 145° C., the sublimate forming small, colourless rhombic plates. A powder composed of 2 per cent. of hydronaphthol with carbonate of magnesium or silicious earth is stated to have advantages over iodoform. It has been said that hydronaphthol corresponds with impure β -naphthol. I have not tested the value of hydronaphthol, but if these assertions are correct they bear out my statements in reference to the value of β -naphthol.

SUPERNUMERARY TEETH.

By CHAS. F. FORSHAW, D.D.S.

I THINK cases of supernumerary teeth must be comparatively rare. I have just been looking through upwards of two hundred volumes of dental journals, English and American, and cannot find a single instance that compares with either Mr. Lakeman's statements or my own, as published in the February and March numbers of the DENTAL RECORD. On pages 355 and 356 of the present edition of "Harris's Principles and Practice of Dentistry," there is an account of two supernumerary teeth having been removed, one from behind and the other at the side of the upper wisdom teeth, and which are now in the anatomical museum of the Baltimore Dental College. As my case was of the same description, and the crown also of a conical shape, I am inclined to think that these must be isolated cases.

Twelve months ago a gentleman (J. C., æt. 43) desired to have about 23 teeth (not stumps) extracted, all of which were loose, but the gum had not left the teeth. His mouth showed signs of recent salivation, owing, I think, to taking mercury for syphilis. He had been under the treatment of several surgeons, and also dentists, in the hope of getting the teeth to fasten again; but each attempt proved futile. So he determined to have them out, and an artificial denture—upper and lower—made, to take their place. I therefore extracted the teeth, among which were the upper central and lateral incisors; and as he wanted the artificial teeth immediately, I made him an upper and lower temporary vulcanite set a fortnight after he had had them extracted. Now, eleven weeks from the day when I operated on him, he came to consult me about the upper denture, which he said was in the habit of occasionally dropping down, and which, he thought, “was due to an upper stump that I had perhaps missed, and that was leaving the gum, and thus pushing them down.” On examination I found it to be a new tooth just appearing through the gum sideways, and as he insisted on having it extracted, I managed, after several attempts, to take it out for him; but I never, during my ten years’ practice, had a tooth so firm in its socket as this case of “third dentition.” The tooth measured quite an inch in length, and its root was half as thick again as an ordinary upper incisor. There was not much bleeding at the time, but when in bed at night it commenced, and lasted, off and on, about three days, during which time the patient lost quite a quart of blood. I tried Ruspini’s Styptic, Liq. Ferri Perchlor. Fort., Tannin, Tinct. Hamamelis, and other powerful astringents, from which he received no benefit whatever. He therefore called in consultation J. H. Bell, Esq., M.D., M.R.C.S., who advised small doses of brandy repeated frequently, and to rinse the mouth with a strong solution of alum at intervals of half an hour. This treatment at last stayed the flow of blood.

In conclusion, I should like to ask the readers of the DENTAL RECORD if they ever had or heard of a similar case:—1st, the tooth appearing so short a time after the teeth were extracted; 2nd, its firmness in the gums; 3rd, its length; and, lastly, the immoderate bleeding consequent on its extraction. Dr. W. H. Dwinelle, in the second number of the eighth volume of the *American Journal of Dental Science*, gives the history of a case of four successive

dentitions of the central incisors. As yet I have seen no attempt to explain the formation of these anomalous productions, though in the 1854 edition of "Medical and Dental Terminology," by Chapin A. Harris, page 221, speaking of third dentition, it says—"As the maxillary bone has previously attained its full size, it rarely if ever happens that alveoli are formed for these accidental productions. They are usually connected with the periosteum of the alveolar border, and this union is sometimes so close and intimate, that very considerable force is necessary for their removal." I may add that, although it is ten months since the operation, the cavity as yet shows no sign of healing up.

DEATH FROM ALVEOLAR ABSCESS.

AT a Meeting of the Medical Society on the 22nd ult. Mr. PEARCE GOULD, F.R.C.S., &c., read notes of a case of alveolar abscess, causing death from thrombosis of the cavernous sinus. A widow, aged fifty-seven, was admitted into the Temperance Hospital with the mouth and teeth in a foul state; a sloughy opening was seen in the centre of the right cheek. An incision was made into the tissues over the jaw from the outside, where fluctuation was detected over the lower part of the masseter; the swelling of the face subsided a little after this, but the patient's general condition was very unsatisfactory. Six molar teeth were extracted on the right side on Feb. 22nd. A probe passed into the external wound detected bare bone; the trismus lessened, but there still remained continued fever and the mouth was very foul-smelling. Some œdema of the right temple had also appeared. Four days after the removal of the teeth, an abscess above the external angular process of the orbit and another in the posterior triangle of the neck were observed, but the external jugular was not thrombosed. The general state did not improve; the pulse was 126, small, and weak; the temperature 103.8° ; respiration stertorous, and crops of herpes about the lips. The patient was very drowsy; there was great œdema of the orbit and chemosis, with some ptosis of the right eye and less of the left; the eyeball could be moved a little from side to side. The patient had some rigors on March 1st. The general asthenia increased, and on March 2nd the conjunctivæ were yellow and motions colourless. Death occurred in a state of coma. At the necropsy several

globular abscesses, with very dense walls, were found in the lungs, and no signs of adjacent inflammation. The liver was fatty and enlarged; the kidneys healthy. There was necrosis of the outer part of the right side of the lower jaw; the temporal muscle was discoloured, but not actually purulent. Some lymph was detected along the basilar process of the occipital bone and sella turcica. The blood was more fluid than usual. The right cavernous sinus was greatly distended, and contained greyish-yellow broken-down pus and clots; the right ophthalmic vein was similarly affected, and the circular sinus with the superior petrosal and lateral sinuses were healthy. The left cavernous sinus contained a clot, of which the inner part was yellow. The case appeared to be an example of a rare condition. The thrombosis had probably spread through the pterygoid veins on the right side to the cavernous sinus, and thence to the right side by the circular sinus.

DENTIGEROUS CYST.

At a meeting of the Pathological Section of the Academy of Medicine in Ireland, held on January 15th, Mr. Arthur W. Baker, M.B., &c., read a communication on a case of dentigerous cyst occurring in the lower jaw of a boy aged 16. The tumour had existed for six months previous to operation. When opened an unerupted canine tooth was found at the bottom of the cyst. This tooth showed the malformation known as dilaceration of its root. The importance of diagnosing cases of this disease was shown by the fact that in a similar case, where the cyst was not recognised, one-half of the jaw had been excised. Commenting on the subject, Mr. Story said there was only one other case on record in which a dilacerated tooth was found occupying the cavity of one of those so-called dentigerous cysts.

SALIVARY CALCULUS.

At the Meeting of the Cambridge Medical Society, held on January 8th, Mr. Carver showed a salivary calculus of unusually large size, which he had removed from a man aged seventy. It formed a swelling in the floor of the mouth to the right of the middle line, and just behind the sublingual gland, and, when explored with a needle, was found to be of stony hardness. It was easily removed with scissors. The patient had only noticed some

tenderness there for about five or six weeks. There was no enlargement of any of the salivary glands or other symptoms. The stone was ovoid in shape, pointed at both ends, and of a pale yellowish-white colour. It weighed $141\frac{1}{2}$ grs., and measured $1\frac{7}{8}$ -in. by $\frac{7}{8}$ -in. broad, with a circumference of $2\frac{1}{4}$ -in. to 3-in. Mr. Carver remarked upon the large size of the calculus, it being one of the largest ever recorded. These calculi were not uncommonly found in the ducts of the sublingual and submaxillary glands, but were rare in Steno's duct. The severity of the symptoms were by no means commensurate with the size of the calculus, in many cases great swelling of the glands and surrounding irritation being caused by a very small concretion.

DENTAL HOSPITAL OF LONDON.

THE Annual General Meeting of the Governors of this Hospital was held at Leicester Square on March 11th, Sir HENRY W. PEEK, Bart., J.P., in the Chair.

The Committee of Management presented their Twenty-eighth Annual Report, announcing that, notwithstanding the general depression of trade, the past year has comparatively been one of prosperity. The total receipts for the year amounted to £1,814 16s. 1d., of that sum £160 16s. was obtained for the reduction of the mortgage. The total expenses were £1,347 17s. 3d. After transferring £450 to Mortgage Account, there remained a balance in the bank of £132 10s. 11d. During the past year the Committee have been enabled to reduce the Mortgage Debt on the Hospital by £500; but they regret, however, that there is still a deficit of £3,000 in the Mortgage Debt Account, and they are reluctantly compelled to make a further special appeal for the funds necessary to pay off this debt, which presses so heavily upon the charity, and greatly curtails the benefits it would otherwise be enabled to confer upon the suffering poor.

In consequence of the continued increase in the number of patients, it has been found absolutely necessary to provide additional accommodation in the Stopping Department, and the room for many years set apart for the use of the Dean and for the meetings of the Medical Committee has been fitted up for this purpose with the necessary chairs, appliances, etc. This extra accommodation

will necessarily prove an additional expense for the charity to maintain.

In the report of the Medical Committee it was stated that the number of patients seeking the benefits of the Institution largely exceeds that of any former year of its history, and an increasingly intelligent appreciation of the various operations performed is in a marked degree noticeable in those who daily present themselves for treatment. The records of those cases which come under the head of Conservative Dental Surgery are particularly gratifying.

The summary of cases treated from January 1st to December 31st, 1885, is as follows:—

Patients	...	...	...	...	...	...	27,083
Extractions	{	Children under 14	...	...	...	...	4,960
		Adults	...	...	...	...	10,184
		Under Nitrous Oxide	...	...	...	...	5,547
Gold Stoppings	...	...	...	...	...	...	2,845
White Foil ditto	}	...	...	...	...	...	8,754
Plastic ditto		...	...	...	...	...
Irregularities of the Teeth treated mechanically	...	...	...	...	...	...	1,574
Miscellaneous Cases...	...	...	...	...	...	...	3,229
Advice Cases...	...	...	...	...	...	...	2,092
Total...							<u>39,185</u>

In April the Committee received with regret the resignation of Mr. S. J. Hutchinson, one of the Dental Surgeons, and on his retirement tendered to him a hearty vote of thanks for his past services to the Hospital in that capacity. As Mr. Hutchinson, however, holds the Lectureship on Dental Surgery, he still retains, by virtue of his office, his place as a Member of the Medical Committee.

In May Mr. Storer Bennett was elevated from the Assistant Dental Surgeonship to the Senior Staff; and in June Mr. Hern, the Demonstrator of cohesive filling, was elected an Assistant-Surgeon.

In June, also, Mr. King resigned his post as Dental House Surgeon, and in July Mr. J. C. V. Crocker was appointed in his stead. At the same time Mr. H. Lloyd Williams was appointed Assistant Dental House Surgeon, and Mr. C. F. Rilot Deputy Assistant.

Mr. Latchmore, who for some time past had filled the position of Demonstrator of non-cohesive filling, was appointed to the Demonstratorship of cohesive filling rendered vacant by the promotion of Mr. Hern.

In August Mr. W. R. Ackland was appointed Demonstrator of non-cohesive filling. Mr. Rilot, also, at this time was appointed an Assistant Dental House Surgeon, it being found necessary to have two assistants, in consequence of the number of students and increasing work of the Hospital.

In December Mr. J. C. V. Crocker resigned his post, and Mr. H. Lloyd Williams was raised to the Senior Dental House Surgeonship. Also in this month, in accordance with the recommendation of the Medical Committee, that two Assistant Anæsthetists should be appointed, in order to lighten the work of the Senior Anæsthetic Staff, and ensure the daily presence in the Hospital of an anæsthetist, when one of the seniors might be unavoidably prevented from attending, Drs. Dudley Buxton and Frederick Hewitt were elected to the new assistant anæsthetic appointments.

The additional accommodation provided by the Managing Committee has already proved of great service, as the number of students entered by the Dean during the past year has been exceptionally large. The students have worked zealously, and the Medical Staff have very great pleasure in being able to say that at the Autumn Examination for the Diploma in Dental Surgery of the Royal College of Surgeons, fourteen students of the London School of Dental Surgery presented themselves for examination, and all were successful.

The CHAIRMAN remarked that it was with great gratification he had attended the meeting upon the invitation of his old friend Sir Edwin Saunders. It was one of the pleasures of life to see men who had risen to the very top of their profession devoting their time and their money to the general benefit of mankind. He (the chairman) was sure that many friends outside were equally with himself very much indebted to Sir Edwin Saunders. One particularly satisfactory part of the report was the improvement in the annual subscriptions, which showed a gradual increase. Such subscriptions were the backbone of charities, and whilst enabling their usefulness to be extended, relieved the anxieties of those who were willing to give time to their affairs. Although

the progress of this hospital had been like the growth of a good strong oak-tree—slow and sure—he should like to see it even in a better financial position. One matter which troubled Sir Edwin Saunders and the committee was the probability that the Hospital might, owing to proposed Metropolitan improvements, have to be removed, and so be shorn of its present proportions, convenient position, and invaluable north light. He hoped not; but if any improvements caused its removal, he trusted that such pressure would be brought to bear upon the Metropolitan Board of Works as to induce them to leave a good frontage site. It appeared to him that there were two classes of the community who ought to support the Dental Hospital—viz., those who had suffered from the teeth, and those who had not. He was one of the former, for he had gone through a martyrdom with his teeth, and he was most thankful for the relief from pain which an increased knowledge of the science of dentistry had brought him. His father-in-law was one of the class not troubled with their teeth—for until about 70 they had given him neither ache nor pain, and then began quietly to drop out. Those who knew the sufferings of toothache should do all they could to support an Institution which did so much to relieve the pain of the sufferers from that complaint; and those who did not know were bound to give a thank-offering to the Hospital for the blessing of freedom from the pain. From the many applications to him for the cards he had to give away he was familiar with the relief which young servants especially had obtained from treatment at the hospital, and he was being continually and most warmly thanked by them for the relief which they had obtained from the misery caused when the teeth were out of order.

After the usual votes of thanks, the meeting terminated.

NATIONAL DENTAL HOSPITAL.

THE Annual Meeting of the subscribers to the National Dental Hospital was held on March 3rd, Mr. Deputy GEORGE SIMS in the chair.

In submitting their Twenty-fourth Annual Report, the Committee of Management are pleased to be able to announce that the Hospital's good work is still increasing, and that the funds to carry on this work also increase year by year, but the funds do

not increase in proportion to the vast amount of good which the Hospital does.

Still, the subscriptions and donations received during 1885 both show an increase over them for 1884, while the payments by patients, the true test of the value of a Hospital, amount to over one-half of the total income. This, as was mentioned in the Report for 1884, should surely entitle the Committee to receive more assistance from the benevolent public in their work.

The total receipts for the year amounted to £756 6s. 2d., and the expenses to £703 9s. 4d., leaving a balance of £52 16s. 10d.

It may be interesting to state that patients have attended the Hospital from the following places during the past year, viz.:—Brighton, Cheshunt, Chislehurst, Croydon, Colchester, Dulwich, Enfield, Eltham, Folkestone, Harrow, Hendon, Hastings, Liverpool, Manchester, Norwich, Northampton, Richmond, Woolwich, and Windsor.

The Committee regret that they have lost during the year the services of one who was mainly instrumental in the greater development of the Hospital's work of late years. Mr. Oakley Coles joined the Committee in 1875, and since then has given much valuable time and attention to the Hospital.

The Committee earnestly hope that during 1886 sufficient help will be received to enable them to provide the additional accommodation so urgently asked for by the Medical Committee, as they regret to say that several of the rooms are still the same as those used when the annual number of cases treated was 6,000 instead of 37,000.

The Medical Committee presented the following annual statement of operations performed from January 1st to December 31st, 1885:—

Number of Patients attended	...	...	...	20,367
Extractions	{ Children under 14	...	...	5,669
	{ Adults	...	...	7,800
	{ Under Nitrous Oxide	...	...	6,329
Gold Stoppings	...	...	...	1,014
Other Stoppings	...	...	...	7,987
Advice and Scaling	...	...	...	3,252
Irregularities of the Teeth	...	...	...	2,754
Miscellaneous	...	...	...	2,552
Total	...	...	...	<u>37,364</u>

These totals show an increase of 1,086 patients, and 4,112 cases over those for 1884.

The Committee venture again to represent how exceedingly their work is interfered with by the smallness of the waiting and extracting rooms, and to point out how desirable it is to have a separate room for the administration of nitrous oxide gas as soon as possible.

Reference was made to the loss sustained by the death of Mr. Tribe, Lecturer on Metallurgy, to the appointment of Mr. Scott Thomson as an Assistant Dental Surgeon, and of Mr. Henry Davis as an Anæsthetist.

The Committee had again this year considered the question of a system of household tickets, entitling subscribers of 10s. 6d. to send their servants free to the hospital (provided that they could not pay a private practitioner for advice), and the General Committee have resolved to adopt the system.

The Advice Cards have again been in great request this year, one lady writing—"I think they cannot be too widely distributed among the poor and ignorant, who are entirely without any idea of the necessity of any effort, however small, to clean their teeth."

The Committee, in conclusion, trust that next year the General Committee will be enabled to place further facilities in the way of the hospital work; and they think that the above record of the great work, done with such small means, cannot be equalled by any other hospital.

The CHAIRMAN, in moving the adoption of the report, regretted that the public did not come forward in greater numbers to assist the charity with their contributions.

Mr. Alderman LEE RYMER, Treasurer, seconded the motion, and referred to the fact of patients coming to the hospital from such great distances, as mentioned in the report of the Committee of Management, and thought the term National was therefore a true one. He also alluded to the large amount of work done and the very small cost.

The report was adopted, and votes of thanks having been accorded, the meeting terminated.

EDINBURGH DENTAL HOSPITAL.

THE Annual Meeting of the Edinburgh Dental Hospital and School was held on 1st February, the chair being occupied by Dr. SMITH, LL.D.

The SECRETARY read the following Report of Dental Staff:—

The Dental Staff, in submitting their Annual Report to the Directors and Contributors, have the pleasant satisfaction of announcing that the Institution with which they have the honour to be connected is yearly becoming better known and better appreciated. This is evinced not only by the steady yearly increase of patients requiring its services, but by the rapid increase of patients requiring the services of the operators in the department devoted to the conservation of the teeth. They are gratified in being able to report that the old established and popular belief that a tooth, once it has given pain, must be extracted, is becoming gradually exploded; and further, they are pleased to state that, as the usefulness of stopped teeth is becoming better known, there is a corresponding increase attached by the poorer classes to the value of these organs, and a relative increase in the necessity of care and attention personally bestowed in regular and daily brushing as necessary adjuncts to the integrity of those little machines which add so materially to long life, inasmuch as when in good condition and doing their proper share of the work of alimentation, they promote good digestion and secure better general health. The number of patients treated last year was 6,689, of which 3,596 were males and 3,093 were females, an increase of 410 on the number treated last year. Of these patients 1,592 had teeth stopped, being an increase in this department of 559 (or more than 50 per cent. over last year) of teeth restored to health and usefulness.

The treatment of special cases, involving the supply of mechanical appliances for the loss of the hard structures of the mouth, is still receiving the careful attention of the Staff, and the services rendered in this direction are much appreciated. The Dental Staff take this opportunity of thanking the Surgeons connected with the Royal Infirmary for placing such cases in their hands for mechanical restoration.

In pursuance of a remit from last Annual Meeting, the Administrative Committee fixed upon a site and prepared plans for the

erection of a new Dental Hospital—the need for which is becoming clamant—but are sorry to report that they could not come to terms with the feuar; they hope, however, by another year to have overcome these preliminary difficulties, and to be able to report that their remit has been satisfactorily accomplished.

The Treasurer has much pleasure in stating that the funds of the Institution are in a satisfactory condition; this, however, is more owing to the economical management of the Administrative Committee than to the vastness of the income. The accounts for the year ending 29th January were—receipts £293 18s. 3½d., expenditure £296 17s. 9½d., leaving a balance due to the Treasurer of £2 19s. 6d. The funds amounted to £314 19s. 11d. The patients attending the Hospital continue to show their appreciation of the services rendered by contributing to the funds. Last year the sum received from this source was £20 10s. 5d.; this year it is £21 18s. 2½d.,—a small proportion of the necessary expense, but a most cheering and welcome acknowledgment of benefits received. The Treasurer would specially acknowledge the most liberal donation received from the Committee entrusted with the distribution of the funds in connection with the Rosebery Charity Cup Football Association. He would also acknowledge the graceful compliment paid to the usefulness of the Institution by the Society for Improving the Condition of the Poor, in alloting the Hospital a donation.

The usefulness of the Hospital as a means of educating the Dental Surgeon of the future is now firmly established and acknowledged.

The earnest attention of the students to their work, their marked success in the various cases entrusted to their care, their professional bearing and sympathetic attention to the patients, continue to merit the commendation of the Dental Staff.

The facilities afforded by this Institution to Medical Students for acquiring a practical knowledge of the diseases of the teeth and their treatment, have been fully appreciated and taken advantage of by such of them as may be looking to the navy or army as their future sphere of practice.

In conclusion, the Staff have to thank the contributors for enabling them to continue their good work, and to acknowledge their indebtedness to the Council of the Odonto-Chirurgical

Society for placing their valuable Museum and Library at the service of the students attending the Hospital.

The report having been adopted and the officers re-elected, the usual votes of thanks terminated the meeting.

VICTORIA DENTAL HOSPITAL, MANCHESTER.

At the Annual General Meeting of Governors of this Institution, held in the Town Hall on Wednesday, 24th February, the Right Rev. the Lord Bishop of Salford in the chair, the Second Annual Report of the Committee of Management was presented.

The attendance of patients during the year 1885 was 8,618. The average morning attendance in 1885 has been exactly double that of 1884, and the average evening attendance has more than trebled during the past year.

One of the objects which the founders of this Hospital had in view in its formation has to a certain extent been attained, or at least developed, during the past year, and the Hospital may now be regarded in the light of a School of Dentistry in connection with the Owens College. The Committee are glad to be able to report that lectures on Dental Surgery, &c., are given at the Owens College School of Medicine, and that a number of students who attend these lectures receive their practical instruction at this Hospital.

The growth of the Hospital, both as a charity and as a school, has been so great that the Committee consider the time to have arrived for appointing a Dental House Surgeon, the presence of such an officer having become absolutely necessary for the efficiency of the Institution, as a means of continuous instruction for students, and to meet the largely-increased sphere of operation which its success has brought upon it. Such an appointment has been postponed as long as it could be done without injury to the working of the system which has hitherto been in vogue. The welfare of the Hospital now imperatively demands this appointment to be made, and though it will naturally increase the expenditure, the Committee have the confident assurance that the public will not be backward in supplying the requisite funds.

The total receipts for the year, including £226 10s. 2d. as

balance from 1884, were £452 1s. 8d., and the expenses £195 9s. 2d., together with £256 12s. 6d. balance and invested stock.

The Dental Committee give a summary of cases treated during the year as follows :—

Boys under 14	...	...	...	...	...	1,966
Girls „ „	...	...	...	...	...	2,332
Men ...	...	...	...	...	...	1,526
Women ...	...	...	...	...	...	2,794
Total						8,618
						<hr/>
Extractions	...	...	...	...	...	6,955
Gold Fillings	...	...	...	...	...	17
Other Fillings	...	...	...	...	..	1,373

Besides these operations a great many cases of irregularities of the teeth were treated mechanically, and there were a large number of advice and miscellaneous cases.

The Committee feel great satisfaction in being able to record that the Hospital has commenced its work as a School of Dental Surgery, and that a number of students are in regular attendance; and they see no reason why, with the advantages to be derived from its connection with the Manchester School of Medicine at Owens College, it should not equal, even if it does not surpass, any provincial school of a similar kind.

The reports were adopted.

ODONTOLOGICAL SOCIETY.

THE Ordinary Monthly Meeting was held on the 1st March, MR. T. CHARTERS WHITE, M.R.C.S., L.D.S., President, in the chair.

MR. FRENCH, of Wolverhampton, sent to the Society a specimen of geminated molars. He took out the second molar and, to his surprise, found another tooth united by cementum.

MR. PENFOLD had presented a picture, dated 1796, showing the primitive method of operating in those days.

THE CURATOR also announced the receipt of a skull and lower jaw of a female dugong; the skull and lower jaw of a young hippopotamus; and the upper jaw and part of the skull of an American wart hog.

Mr. STORER BENNETT (the Curator) said that Dr. Herbst, of Bremen, had kindly sent them some specimens, including several teeth which he and some of his pupils had filled with Wolrab's gold; some matrices, which he called "ring matrices," and which were easily made; two models in gold, made from a signet ring, to prepare which only took five minutes each; a bicuspid with a ring matrix attached, which took only 45 minutes to fill; a large molar tooth, built up from the root in an hour and a quarter; a central incisor, with a very shallow cavity on the surface, filled by the rotary process.

Mr. J. C. FORAN sent a model of the mouth of a girl 13 years of age, showing the effects of necrosis caused by typhoid fever, with the following history. Five years ago, or when the patient was eight years old, she was living with her parents in Bermuda, and then had a very severe attack of typhoid fever. Before she had recovered it was noticed that her four lower incisors were loose, and very shortly the child was found with one of the teeth in her hand. This was immediately followed by the loss of the other incisors, and the removal of portions of the necrosed alveolus. Nothing was done to the remaining teeth. Shortly after convalescence the canines were erupted, and they moved forward, nearly filling the gap, as now seen in the model. The upper teeth are quite normal, except that the arch is rather crowded, notwithstanding the fact that the two upper first bicuspid have been extracted to make room. Three or four teeth are slightly decayed and have been filled. The model was presented to the Society for the museum.

Dr. FIELD described a new dental engine which Messrs. Jamieson had sent for inspection, the main feature of which is that the cord or band is dispensed with. When the treadle is worked the upright rod itself is set in motion, which in its turn extends the power along the arm to the hand-piece by means of a small friction bevel-wheel at the top of the rod running upon a similar disc at the end of the flexible arm. The surfaces where contact is made are covered with leather. Dr. Field claimed that the points in favour of the invention were—that there was no cord to get twisted, and that the motion was noiseless. He also showed two scalers, mentioned the previous month by Dr. Harlan, for removing the very fine scale of tartar from the inferior teeth.

THE PRESIDENT then called upon Dr. Dudley Buxton to read his paper on

THE PHYSIOLOGICAL ACTION OF NITROUS OXIDE.

Dr. Buxton said the subject he had chosen was one which had on several occasions been brought before the Society, and one in which the Society had always taken a keen interest; it was, moreover, one on which the members could speak from large experience as a body of experts. Whilst, therefore, he had great pleasure in laying before them such facts as he had been able to collect, he hoped also to gather a fresh store of information in the course of the evening, resulting from their prolonged experience and careful personal observation.

As the subject was a wide one, he had obtained permission to divide his paper into two parts, and he proposed that evening to bring in review the facts bearing upon the physiological action of nitrous oxide, and to sift the evidence of which they were already possessed, reserving for another occasion the more strictly experimental part of his researches until the ground had been cleared from mere *à priori* reasoning. It would therefore be his aim so to marshal the facts already known that their true bearing might be made clear, and the gaps which still existed in the chain of evidence, made apparent.

Nitrous oxide produced a state of anæsthesia, or loss of sensation; it also produced certain emotional states—a feeling of exhilaration; and it produced certain effects on the respiration, circulation, and muscular system. These were the apparent effects of nitrous oxide, but some of the phenomena were not due to the direct action of the gas, but should rather be looked upon as accidental complications, due to the method of administering the gas. The main point of interest in the physiological action of nitrous oxide was its anæsthetic effect. The various anæsthetic agents might be classified according as they acted on the sensory end-organs, the conducting sensory nerve fibres, or the receiving and perceptive centres. He proceeded to show that nitrous oxide belonged to the last-mentioned group, sensation being retained during its administration until the perceptive centres ceased to receive impressions. During the stage immediately preceding loss of consciousness persons under the influence of nitrous oxide were hyperæsthetic—all sensations being exaggerated—owing to

the fact that whilst the receiving and conducting organs were unimpaired, the central controlling and perceptive functions of the brain were weakened.

The next point to be considered was how the gas entered the system, and was enabled to exert its influence on the nerve centres. It was now established as a fact that nitrous oxide was not decomposed in the body, and Dr. Buxton suggested that it probably entered into combination with the colouring matter of the blood, as it had been shown that carbon monoxide, hydrocyanic acid, and the nitrites were capable of doing. This was difficult of proof, but at all events it seemed evident that nitrous oxide exercised a direct specific action of its own on the nervous centres, just as strychnine and other bodies did. The difficulty of ascertaining the precise condition in which the gas existed in the system was greatly increased by the fact that, as usually given, the conditions were complicated by asphyxial effects; but this factor had been eliminated by the well-known method of administering the gas under pressure devised by M. Paul Bert, by which he was able to supply the bodily need of oxygen side by side with enough nitrous oxide to produce its full narcotic effect.

Dr. Buxton then entered into a minute description and analysis of the phenomena of asphyxia, pointing out the marked differences between them and those produced by nitrous oxide, proving that the latter did not act merely as an irrespirable gas, such as nitrogen or hydrogen. Thus, in ordinary asphyxia there was a rapid rise of blood-pressure persisting during the first and second stages—those of dyspnoea and convulsions—together with a coincident acceleration of the heart-beat. During the third stage, that of exhaustion, the blood-pressure falls rapidly, and the heart-beats become slow and feeble, and finally cease, the duration of the whole being four or five minutes.

When nitrogen was breathed no change took place in the respiration at first, then came the tumultuous breathing of dyspnoea; subsequently expiration becomes markedly in excess of inspiration and expiratory convulsions ensue. Under the influence of nitrous oxide the respirations were at first increased in number, but were otherwise regular, then became slower, and finally stertorous. Dr. Buxton had made numerous tracings with the sphygmograph, and in no case had he found any marked increase, whilst in most there was an actual lessening of tension. He

exhibited a selection of those tracings and pointed out their peculiarities, showing that nitrous oxide, pushed to the extent of narcosis, did not give rise to circulatory changes at all comparable to those occurring in the course of asphyxia. It was, of course, a fact that the respiration of nitrous oxide, if carried on long enough, would be followed by death from asphyxia; but the narcosis and the asphyxia were quite independent of one another, the one being due to the action of the gas on the nervous centres and the other to deprivation of oxygen.

It might, then, be concluded that nitrous oxide produces narcosis by virtue of other than asphyxiating qualities; that entering the blood through the lungs it exercised a specific action on the nervous centres. This explained an otherwise anomalous fact, viz., that certain persons evinced the utmost toleration of nitrous oxide, resisting its action for a minute or more, and requiring a very large dose to produce the desired effect.

It was impossible for him to enter upon the discussion of the nature of this specific action within the time at his disposal, and he would reserve this for elaboration in another paper, when he hoped to return to the consideration of a subject which was as difficult as it was interesting, and as complex as it was important.

DISCUSSION.

Mr. BRAINE said that he had listened with a great deal of pleasure to Dr. Buxton's paper, but until the second half had been heard he thought they were scarcely in a position to discuss it.

Mr. W. BOWMAN MACLEOD wished to make a suggestion as to a point to which Dr. Buxton had not alluded. The first gas that came off the retort during the distillation of nitrate of ammonia was what is known as "laughing gas," and in a short time you had the purer nitrous oxide. In the old days, before liquid gas was supplied, he had made nitrous oxide gas himself, and had taken off what is called the "fore-shot" in a separate bag. He had breathed both gases, and the result of the first was intense exhilaration, and a similiar physiological action to taking hemp distillation. He had then breathed the warm fresh gas from the retort and found that it was only placidly exhilarating, and quickly produced narcotic effects.

Mr. BIRD thought there were one or two points that might be considered before the reading of the second portion of the paper.

The centre of the paper was that which interested him most, viz., the reference to the patient. Until a run of normal patients was obtained it would be impossible to get a run of normal experiments. Then with regard to the breathing of nitrogen, he would remind Dr. Buxton that nitrogen was an insoluble gas, while nitrous oxide was not. The latter was taken up by the blood, the composition of which thus became changed.

Mr. HUTCHINSON wished to know what justification Dr. Buxton had for the assertion that apnœa never produces anæsthesia. There is a way of producing a state of apnœa by rapid respiration. If we breathe very rapidly until we cannot keep it up any longer it is quite certain that anæsthesia is produced to a certain extent. It must not be forgotten also that the conditions of nitrous oxide narcosis differed greatly according as it was given with the expiratory valve closed or opened. In the first case, the gas and expired air being rebreathed, there was excess of nitrogen, with deficiency of oxygen, whilst in the other there was deprivation of oxygen.

Mr. HEWITT thought that facts pointed strongly to the conclusion that nitrous oxide acted in the same way as ether, chloroform, and other anæsthetics—*i.e.*, it was absorbed by the blood in the pulmonary circulation, was carried by it to the brain, and acted on the higher centres just as they did. Analysis of the products of respiration during administration of the gas showed that these consisted at first of nitrous oxide and expired air, and later chiefly of nitrous oxide, and that they did not contain any excess of nitrogen or of oxygen, showing that the gas was not decomposed in the blood. There could be no doubt, however, that in the ordinary mode of administration the anæsthesia produced was due to a double cause—it was partly the result of the narcotic effect of the gas, and partly asphyxial from deprivation of oxygen. The object to be aimed at was to get as much of the former and as little of the latter as possible, or at all events to delay it as long as possible. By M. Paul Bert's method the tendency to asphyxia was obviated altogether, and it could be delayed by the use of the supplemental bag.

If, when the gas was given, the expired air and gas was suffered to escape, a certain amount of the oxygen in the lungs was lost at each expiration until it was all gone; nitrous oxide alone was then presented to the brain centres, and the respiratory

movements could no longer be carried on. But if, after washing out the lungs with nitrous oxide, the supplemental bag was used, a small quantity of oxygen was still supplied with each inspiration, and by this means anæsthesia could be maintained for a longer period. He had found by analysis that a two-gallon supplemental bag at the end of an ordinary administration still contained two or three per cent. of oxygen.

Mr. HENRI WEISS said he had been greatly interested by the sphygmographic tracings which Dr. Buxton had exhibited, and he thought that others besides himself must have learned with pleasure that the blood pressure was reduced during the administration of nitrous oxide, and not increased, as had generally been supposed to be the case, and that there need not therefore be any hesitation in giving gas to individuals of full habit for fear of increasing the liability of apoplexy.

The PRESIDENT said he had also been greatly interested in seeing the effect of the gas on the circulation, as shown by the sphygmographic tracings, the more so since he had himself made some observations under the microscope, with reference to the effect of chloroform on the circulation of the frog. It acted as a very decided depressant, the blood current getting gradually slower until the corpuscles could be seen to regurgitate after each feeble pulsation, and at last became quite stationary. He must now call upon Dr. Buxton for his reply.

Dr. Buxton remarked that it would take more time than he had at his disposal to answer fully some of the questions put to him; he would therefore content himself with very brief replies to the criticisms which had been made on his paper. He was much obliged to Mr. Macleod for the hint which he had given him, and should take an early opportunity of trying to find out the cause of the difference to which he had called attention. The fact that nitrogen was an insoluble gas, whilst nitrous oxide was soluble, did not appear to him to be of much importance, or to throw much light on the problem they had to solve. He quite agreed with Mr. Bird as to the importance of eliminating as far as possible all sources of error in making experiments on individuals, and with this view all his own experiments had been made on personal friends and not on patients. He still held that apnoæal states were not necessarily anæsthetic. Dr. Bonwill's plan acted

by exhausting the nervous system for the time, just as any great muscular exertion would do.

Mr. Hewitt had said that nitrous oxide circulated as a gas. He (Dr. Buxton) had not been able to obtain any proof of this, nor did he know that any one else had succeeded in doing so. Dr. Frankland, indeed, in the course of the experiments on rabbits referred to in the paper, had found that the products of respiration contained a slight excess of nitrogen, which might possibly be an indication that the part played by nitrous oxide in the system was not quite as simple as Mr. Hewitt seemed to think; otherwise, the views expressed by Mr. Hewitt agreed very closely with his own, since the aim of his paper had been to show that the anæsthesia produced by nitrous oxide was central—due to changes in the cortical cells of the brain—that the end organs had nothing to do with it, and that the phenomena produced by it were altogether distinct from those produced by ordinary asphyxia. In the first place the effect was much more rapid. Had any one known insensibility to be produced by asphyxia in half a minute? And in the next place, when the oxygen of the blood was exhausted so as to produce asphyxia, the respiratory centres in the medulla became paralysed and the movements of respiration ceased; whilst under gas complete insensibility co-existed with regular breathing. He thought there was sufficient evidence to show that nitrous oxide acted as a stimulating narcotic, though no doubt some of the symptoms produced during the ordinary mode of administration were due to partial asphyxia. There was also the important fact that the state of the circulation during nitrous oxide narcosis was absolutely distinct from that produced by asphyxia, and any one who wished to prove that nitrous oxide acted simply by producing a state of partial asphyxia must be prepared to invalidate the evidence he had brought forward in proof of this difference.

The PRESIDENT then thanked Dr. Buxton on behalf of the Society for his paper, and the meeting adjourned.

DEATH FROM CHLOROFORM.

OF the unfortunate death of the Lady Flora Wilmot, whilst under the influence of chloroform for the extraction of a tooth Mr. J. Farrant Fry, the medical practitioner who administered

the anæsthetic, communicates to *The Lancet* the following observations:—

I beg to forward you particulars of the recent death here from chloroform. The Lady Flora Wilmot, aged twenty-five years, had been under my care for various minor ailments during the last eighteen months. With the exception of a gouty tendency, her constitution was, I believe, sound. On Wednesday, Feb. 24th, I was asked to meet her at Mr. Scott's residence at Swansea (her dentist) for the purpose of administering an anæsthetic for the extraction of the right molar tooth. Nitrous oxide gas not being available, I gave chloroform in preference to bichloride of methylene or ether (both of which I had by me), because for the purpose I considered it the best anæsthetic, and also because her ladyship, having taken it two or three times before, expressed a preference for it. Everything about the chest being perfectly loose, and the patient sitting in the dentist's chair, less than a drachm was sprinkled on lint in an open inhaler, which the gag kept from closely fitting round the mouth and nose. A similar quantity of chloroform was added a second and third time before perfect anæsthesia occurred. The tooth was then removed, and recovery followed without a bad symptom. The patient had taken it capitally, and in all two drachms had been given. Five days afterwards (March 1st) I again administered chloroform for Mr. Scott (this time at the patient's residence) to remove the adjoining bicuspid tooth. The patient was seated in a low deep-backed well-pillowed easy chair, and was therefore more reclining than on the former occasion. The result of the chloroform before having been so satisfactory, I again administered it in the same way, and, as before, two drachms were given in all, with a similarly good result. The inhaler having been removed, Mr. Scott took out the tooth, cleaned his forceps, and stood by the patient's side. I remarked, "I hate giving chloroform for you dentists, because you will have your patients sitting up." This led to a reply from Mr. Scott, who then poured out a tumblerful of water and asked the patient to rinse her mouth, as the gums were bleeding. No water was taken, and I observed she was not sufficiently conscious yet, and we still stood by the patient. I had during this time one finger on the temporal artery, whilst with the other hand I was raising the eyelid and watching the pupil, which, having been dilated during unconsciousness, had become

normal and the conjunctiva sensitive. Suddenly the pupil became again widely dilated, I could no longer feel the pulse, and the face became blanched. The chair was immediately turned back, the head lowered to the ground, and the body and limbs raised. Nitrite of amyl sprinkled on a handkerchief was applied to the nose, and, although the heart could not be felt beating, the breathing still continued for, I should say, at least two minutes. Artificial respiration, drawing out the tongue, and lifting the jaw forward, were of no avail—not the slightest sign of recovery followed. A *post-mortem* examination was refused.

THE DENTAL MANUFACTURING COMPANY.

THE Annual Meeting of Shareholders of the above-named Company was held on the 27th ult.

The CHAIRMAN (Mr. Duncan D. Hepburn), in moving the adoption of the 12th Annual Report, said there were good reasons for congratulation. During the past year, notwithstanding the universal depression of trade, they had done nearly £1,000 more than the large amount of the previous year, and this in the face of keen competition. The second paragraph of the Report states a loss of £254, arising from the dishonesty of one of the clerks; such a misfortune the Directors could scarcely contemplate. The making of teeth—perhaps the most important branch of their manufactures—has engaged the utmost attention of the Manager and Directors, and now they can unhesitatingly state that the teeth will bear the strictest tests, both as to natural appearance as well as fitness to stand all the purposes that the most critical judges might desire; the only regret was that they cannot, at present, supply the great demand for them. The DENTAL RECORD, published by the Company, has an extending circulation; it meets the wants of the profession by its selected articles on dental subjects, and contains the latest discoveries of any value to Dentists. It is satisfactory to know that the RECORD account shows a profit for the year. This Company is not open to the public; it is, in a sense, a private co-operative firm, each shareholder a partner; and the benefit from this is in accordance as members act up to the lines of the ready-money system, and thus reap larger dividends.

Dr. J. S. CRAPPER, in seconding the adoption of the Report,

remarked that it had been very carefully audited, and they felt in every way satisfied that the Balance Sheet before them was a correct one. He considered that it was also a very satisfactory one for them all. It might be considered by some that a 5 per cent. dividend was a small one for them to receive, but he would remind them that it was very much better to have a dividend which was paid on a safe investment than to receive a larger dividend upon their money in a concern which was without stability. He would remind them that an important feature of this Company was the production of first-class goods; great improvements had been made in their teeth lately, and he might safely assert that they were superior to any previously manufactured in this country, both for strength and translucency. It was the constant aim of the Directors and Manager to keep up the reputation they had secured for excellence in teeth, instruments, rubbers, and tools generally.

Dr. WORMALD supported the motion. They would notice that their capital account had been increased to the extent of the last call. They had also an increase in their sales for the year. He was glad to state that their expenses showed a considerable decrease, as also their plant account, and the stock but a very slight increase. These items taken together were very satisfactory. If shareholders wished to assist the Directors in making the best use of the capital, they could not do better than take as short credit as possible, so that the Company could turn over its capital more often. A ready-money system of business would reduce the clerical work and make the dividends much larger. He was glad to hear the Auditor express himself as satisfied with the way in which the books were kept, and he considered the staff small for the large amount of clerical work got through. The Company paying 5 per cent. dividend and 10 per cent. on goods purchased ought to be considered good in the face of so many commercial failures. With the improved means of manufacture which they now had he hoped to see still larger dividends and a further strengthening of the Company, which had done so much for the profession by bringing about a genuine and healthy rivalry, and therefore serving the best interests of the Dental Profession at large.

On being put to the meeting, the Report and Balance Sheet were unanimously adopted.

The two retiring Directors, Mr. Duncan D. Hepburn and Dr. J. Sugden Crapper, were re-elected.

A vote of thanks was accorded to the Secretary and Manager, Mr. Brewster, and the employés working under him.

Mr. GREGSON said they had every reason to be satisfied with their inestimable Manager (Mr. Brewster) for the way in which he had carried on the business, and the employés generally for the way in which they had worked with him.

Mr. BREWSTER, in reply, sincerely thanked the Directors and shareholders present for the very kind vote of thanks accorded to him and his fellow-workers, and assured them that no effort would be spared to make the Company a large and substantial one.

A CASE OF REPLANTATION.

By CHAS. F. FORSHAW, D.D.S.

WHILE the cases of replantation, reported in last month's RECORD (p. 105), are yet fresh in the minds of its readers, the following may perhaps be of interest to some of them.

B. G., æt. 23, had had the lower right central incisor broken by attempted extraction. The margin of the gum around the fractured root became much inflamed, and caused him intense pain. The stump was situate midway between the left central and the right lateral incisors; and, as no hold of the root could be obtained, I determined to extract the left central incisor and afterwards to replace it. Having removed that tooth I could now easily obtain a firm grasp of the stump, and after I had extracted it I washed the sound incisor in a weak solution of carbolic acid, asked the patient to rinse the mouth with lukewarm water, and within a minute of extracting it, replaced it.

This is now 19 months ago. I saw the patient last week, and he had not had any inconvenience with it since the operation. The tooth showed no signs of discoloration, and it was quite firm ten days after its replantation.

At the Lincoln Assizes in February last a dentist, named Trotter, was sentenced to twelve months' imprisonment for a criminal assault on a girl.

NEW INVENTIONS.

THE UNIVERSAL TOOTH BRUSH.

THIS brush is the invention of Mr. J. C. S. Harper, L.D.S.I. It is furnished with a convex set of bristles at one end, and a concave set at the other. The concave brush is attached to the

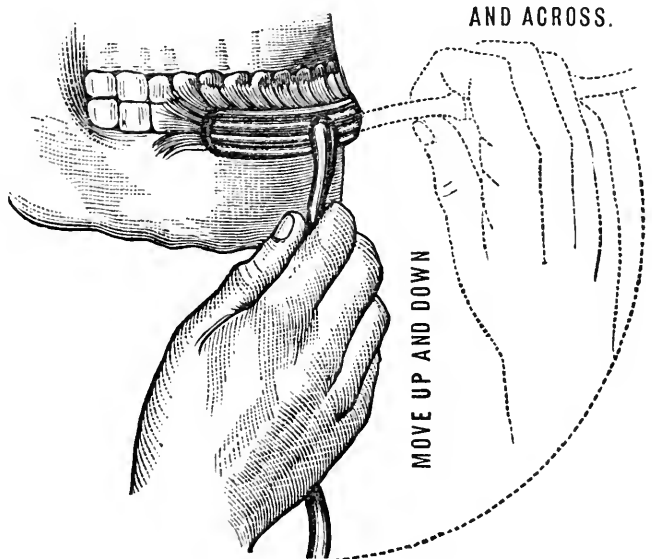


DIAGRAM I.

handle by means of a swivel, and its object is to cleanse the outer surface of and the interstices between the teeth. The swivel admits of the operator using the brush either perpendicularly or horizontally, as shown in Diagram I.

The object of the convex brush is to cleanse the inner surface of and the interstices between the teeth, also of their tops or crowns. This brush admits either a perpendicular or rotary motion in its application. See Diagram II.

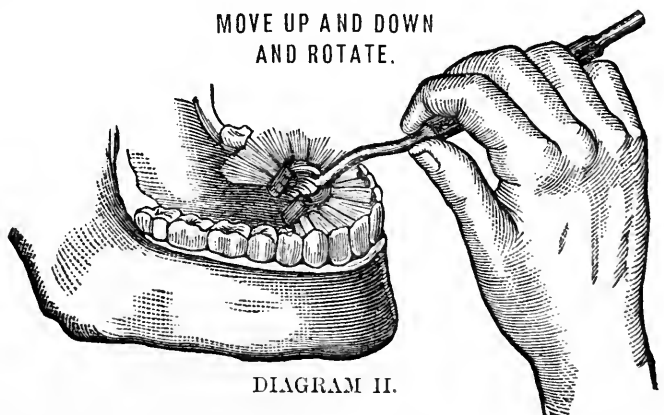


DIAGRAM II.

PLUGGER POINTS WITH VULCANITE HANDLES.

MR. GRAYSTON, L.D.S.I., lately brought out an adaptation of vulcanite handles to plugger points, the object being to reduce the jar produced by the blow given with the mallet. By having the handles of different coloured rubbers, as devised some time ago by Dr. W. St. George Elliott, the selecting of any particular point is facilitated.

JOURNALISTIC SUMMARY.

THE INDEPENDENT PRACTITIONER. (*February, NEW YORK.*)

"FURTHER EVIDENCES OF PREHISTORIC DENTISTRY," by J. G. Van Marter, A.B., D.D.S., Rome. Since my communication of last year, I have pursued my researches after reliable traces of early dentistry. In the library of the Barberini Palace, in this city, most carefully guarded by lock and key and screw, I found, among what the librarian called "the sacred dust of three thousand years ago," another Etruscan relic. It proved to be four natural teeth—two superior central incisors, lateral and cuspid—banded together with pure gold bands, and attached to adjoining teeth precisely like those described by me formerly. This case belongs to the same period as those I found at Corneto, and in workmanship was so nearly identical that it might have been made by the same dentist. It was taken from an Etruscan tomb at Palestrini, near Rome, with numerous fine specimens of gold and bronze-work. As a specimen of early tooth filling, this case is an utter failure, for the gold was *on* and *around*, and not in the teeth. Likewise, the gold in the mummy teeth, in the museum at Naples, reported to me by authorities, has vanished, and is not even *on* nor *around* the teeth.

It gives me pleasure to be able to send herewith several photographs of some of the best preserved remains in Etruscan tombs, which were taken in the Museum of Bologna. In the photo marked No. 1 the teeth were exceedingly fine in form and preservation. In No. 2 the teeth were equally fine, but twenty-eight in number, with no trace or sign of there ever having been thirty-two. In three other skulls I noted the same want of the third molars. Evidently they were never developed. It is worthy of note that, in the comparatively few remains of prehistoric skulls in the above collection, there should be such a proportion of

those in which the third molar does not appear. About one-fourth of the third molars were wanting. What then becomes of the theory that the wisdom teeth are becoming rudimentary and disappearing?

By the side of these Etruscan remains lie one Umbrian skeleton and ten skulls. The teeth in these skulls were very fine. Although these Umbrians preceded the Etruscan race, their heads were of the same type and size, with nothing particular to remark about them. There was an extensive collection of Umbrian domestic articles, such as safety pins, various ornaments, hammers, bridle bits for horses, the same form as that used in these modern times, and a vast number of other things.

I must not omit to mention that in this Bologna collection there is an Egyptian mummy, in which the superior left central and lateral incisors were decayed away, and the right central about half broken down with caries. There were also numerous specimens of early Gallic teeth in this museum, from the Province of Succa, in various stages of malformation, decay, and irregularity.

The most recently opened, and the oldest Etruscan tomb yet discovered in Italy, was lately excavated at Capadimonti, near the Lake of Bolsena. The entire contents of this tomb, including three teeth bound together with a band of pure gold, gold spiral rings for the side hair, silver finger ring, necklace of amber and glass, arm band, bronzes, vases, &c. The part of this find of interest to our profession is the three teeth, a drawing of which I send. This tomb belongs to the Sixth Century B.C., or about one hundred years prior to the dates of the oldest partial denture which I sent you last year.

The manner of banding the teeth together is more primitive than the Corneto dental specimen, and marks a distinctly earlier stage of pre-Roman dentistry. There is nothing to indicate that these three teeth were attached to any adjoining teeth, and we are left to conjecture whether they were loose natural teeth, supported by the gold band, or if the cuspid were transplanted and held in position by the gold band around the lateral and bicuspid.

Still older than this Etruscan specimen, I am assured by competent authorities, is the specimen of Phœnecian dentistry in the Museum of the Louvre, Paris.

It will be observed that this Phœnecian example of dental handiwork marks a still earlier period in the art of dentistry than the two other styles which I have already described.

We have, then, the illustration of the Etruscan, 500 years B.C., which I sent you last year, the 600 years B.C., which I now send you, and the Phœnecian.

"ON CERTAIN FERMENTATIVE PROCESSES IN THE ALIMENTARY CANAL, AND THE MICRO-ORGANISMS BY WHICH THEY ARE PRODUCED," by Prof. W. D. Miller, Berlin. The mouth furnishes, under many circumstances, the best conditions for the growth of micro-organisms. The largest number which I have found in any one mouth at the same time is eleven, not including the well-known *Leptothrix buccalis*, *Spirochæte dentium*, and *Vibrio buccalis*, which no one has yet succeeded in cultivating.

Of twenty-five different kinds of bacteria which I have isolated from the secretions of the human mouth, twelve are cocci and thirteen bacilli or bacteria. It was not possible in all cases to make a distinction between bacilli and bacteria, since many kinds produce at the same time long rods (bacilli) and short rods (bacteria).

Twelve of the mouth-bacteria I found again in the fæces, and eight in the contents of the stomach. In the latter case the material for the investigations was furnished by a gentleman who could evacuate his stomach at will an hour or two after partaking of a small quantity of fruit, particularly strawberries.

It is, perhaps, allowable to take for granted that all the stomach bacteria enter the stomach along with the food; it is much less probable that they find entrance from the duodenum, although the possibility cannot be entirely excluded. Many micro-organisms resist the action of the gastric juice because the fungi which are swallowed at the beginning of a meal do not pass into a stomach filled with gastric juice, but into an empty stomach with a neutral or alkaline reaction, where free hydrochloric acid, in detectable quantities, does not appear until after the lapse of one-half to one and one-half hours. The fungi are often imbedded in solid particles of food, thus escaping for a while the action of the juice. Liquid substances do not remain long in the stomach, but soon pass into the duodenum, and carry with them the fungi before any considerable quantity of gastric juice has been secreted.

THE ARCHIVES OF DENTISTRY. (*March, St. LOUIS.*)

"HINTS ON THE USE OF PEROXIDE OF HYDROGEN" is the subject of an editorial article. Perhaps the most valuable use of it is in purifying the roots of teeth in which the pulps have died and decomposed. To illustrate, we will give our experience with two central incisors in the same mouth. The two teeth had been filled at quite an early age, perhaps fifteen years, the patient, a lady, being about twenty-five when we filled the teeth.

Applied the rubber dam, removed all the decay without reaching the pulp chamber, the teeth being void of sensibility and having that peculiar appearance belonging to a tooth having a dead pulp; proceeded excavating, until the pulp chamber was penetrated, found the chamber filled with a soft, offensive mass. Applied on cotton, peroxide of hydrogen, after removing all the putrid mass that we could with a broach; continued to apply H_2O_2 until there ceased to be any bubbles, applied iodoform, dried the cavity, filled the canals with gutta-percha and the tooth with gold. That was in September, 1884. The tooth has given no trouble since.

On the following day treated the other incisor, but found the pulp canal filled with pus when opened. The same happy result followed as in the case of its fellow of the opposite side.

Since that time have pursued the same practice in a number of similar cases. Deem it good practice to wipe out all cavities with H_2O_2 just previous to filling.

Have also used it in abscessed antrums and other places where there was pus to be removed. Also used it in nasal catarrh; here it should be diluted one-half with warm water.

A simple test is to take a few drops in the mouth; it will form bubbles if it is good. Druggists keep it in bulk, and sell it to ladies to bleach the hair. No doubt this is a profitable way of dispensing it, but the dentist should always procure it in the original bottle, and in hot weather keep it in a dark, cool place, well corked.

"DANGERS IN DENTAL OPERATIONS." The remote dangers of dental operations are few, but from time to time serious consequences are brought forth. The death of a gentleman residing in our city from "lock-jaw," following the extraction of two teeth, brings this subject home to us.

Recently, in England, a dentist in extracting a bicuspid broke the beak of the forceps, which found lodgment in the right bronchus about an inch beyond the bifurcation of the trachea. In this case a surgeon made an opening into the "wind-pipe," removed the broken beak, which was fully an inch in length; the patient recovered.

At the Mississippi State Dental Association in 1884, Dr. Morgan said he was diametrically opposed to the practice of replanting and transplanting teeth. Related a case of an eminent dentist in Philadelphia, who extracted a lower molar for a young lady and replanted it. The tooth did well for two days, but on the third day he was sent for hurriedly by the family of the young lady; found the patient suffering very much, and after sitting by her bedside for twelve days, in constant attendance, she died of "lock-jaw," and this had deterred him from ever attempting the operation of replanting.

OBITUARY.

THE death is announced of A. H. Best, M.D., L.D.S.I., of Savannah, which occurred on the 27th December, 1885. He had had indifferent health for some years, yet he was a frequent writer, and his literary contributions to the DENTAL RECORD were interesting, valuable, and much appreciated. The loss of Dr. Best is regretted by a large circle of friends and acquaintances.

MONTHLY STATEMENT of operations performed at the two Dental Hospitals in London and the Birmingham Dental Hospital, from February 1 to February 28, 1886:—

			National.		London.		Birmghm.
Number of Patients attended	...	...	1582	...	—	...	762
Extractions	{ Children under 14	...	372	...	813	...	} 549
	{ Adults	...	626	...	258	...	
	{ Under Nitrous Oxide	...	460	...	503	...	
Gold Stoppings	...	...	74	...	283	...	—
Other Stoppings	...	...	675	...	1318	...	77
Advice and Scaling	...	...	290	...	159	...	—
Irregularities of the Teeth	...	...	213	...	172	...	8
Miscellaneous	...	...	156	...	420	...	123
Total	...	...	<u>2866</u>	...	<u>3926</u>	...	<u>777</u>

Editorial.**THE DENTAL HOSPITALS.**

THE reports, given in this number of the DENTAL RECORD, of the annual meetings of the two metropolitan and of two provincial Dental Hospitals are interesting of themselves, whilst, taken collectively and comparatively, they are not without instruction. The following tabular statement is sufficiently explicit, and needs no explanation, beyond alluding to the foot-note :—

	LONDON.	NATIONAL.	EDINBURGH.	MANCHESTER.
Working Expenses...	£1,318 11 11	£703 9 4	£227 9 0	£195 9 2
Patients	27,083	20,367	6,689	8,618
Cost per Patient ...	1s. 0d.*	os. 8¼d.*	os. 8½d.†	os. 5¼d.‡
Cases	39,185	37,364	—	—
Cost per Case... ..	os. 8d.	os. 4½d.	—	—
Fillings	11,599	9,001	1,592	1,390
Cost per Filling, } estimated in rela- } tion to Working } Expenses }	2s. 3¼d.	1s. 6¾d.	2s. 10¼d.	2s. 9½d.

The salaries of House Surgeon, Secretary and Porter form a heavy item in the expenses of a Dental Hospital, and therefore special reference is made to the existence or the non-existence of any of those officers.

The economical management of a charity is one of the strongest claims that a committee can urge upon the benevolent. The differences in the cost of management, as are shown in the foregoing table, may be of use in several ways. That the comparative expenses, in whichever way considered, should be so widely varied in the two London hospitals, gives rise to questions of importance.

* Paid House Surgeon, Secretary and Porter.

† Paid House Surgeon ; no Secretary ; Porter 2 guineas.

‡ No Paid House Surgeon ; no Porter.

A PLEA IN BEHALF OF THE L.D.S.Eng.

IN the story which is appearing in the form of a monthly supplement to the DENTAL RECORD, allusions have recently been made to several subjects pertinent to the present time. Amongst the difficulties that beset "Thurley Tighe" is the fact, referred to in chap. xvi., p. 122, "that so long as certain licensing bodies permit those already on the register to go up for merely nominal examinations, and confer upon them the title of Licentiate in Dental Surgery, while other institutions have hitherto demanded, and still continue to demand, the carrying out of a curriculum, our position must remain a painful anomaly."

This, of course, applies to those who voluntarily complied with the curriculum and obtained the L.D.S.Eng. before a Preliminary Examination in Arts, or even dental education, was made compulsory. The autobiographer continues :—

"All this would, in a certain sense, disappear if the College of Surgeons of England only allowed those who possess their certificate of L.D.S. by curriculum to continue their studies and take the Membership. When the Licentiate-ship was originally instituted, the Preliminary Examination in Arts was not demanded for this degree, although it was necessary for the Membership. Now that the dental qualification is freely given by other Colleges, without any prescribed course of study, such a concession would prove that the English College is not unmindful of those who were the first to make themselves competent to pass the demanded examination."

If the College granted that exemption, doubtless several of those dental licentiates of the College to whom the concession applied would take advantage of it. In so doing they would raise themselves in the professional status, and also tend to further elevate the dental profession.

GOSSIP.

It is generally said that dew forms copiously on grass, while none is deposited on roads, because grass is a good radiator and cools quicker, and cools more, than the surface of a road. This is only partly true. Mr. Aitken shows that dew really does form abundantly on roads, and that the reason it has not been observed is that it has not been sought for at the correct place. We are not entitled to expect to find dew on the surface of roads as on the surface of grass, because stones are good conductors of heat, and, the vapour-tension being higher underneath than above the stones, the result is, the rising vapour gets condensed on the under sides of the stones. Again, the stones being fair conductors, and in heat-communication with the ground, the temperature of the surface of the road is, from observations taken on several occasions, higher than that of the surface of the grass alongside. The air in contact with the stones is, therefore, not cooled so much as that in contact with the grass. For studying the formation of dew on roads, slates may be placed over a gravelly part of the road, and over a hard dry part. Examined on dewy nights the under sides of these slates will be found to be dripping wet, while the upper surfaces and the ground all round is quite dry.

THE usual monthly meeting of the Edinburgh Dental Students' Society was held in the rooms, 30, Chambers Street, on March the 8th, when Mr. Frederick Page opened a discussion on Mr. Durward's paper, "The Difficulties of a Junior Practitioner."

PROFESSOR TURNER, F.R.S., has received the honour of knighthood—a fitting recognition of his vast labours as a teacher and an anatomist.

No solution, says Dr. William Alexander, can equal in efficacy one of corrosive sublimate for washing out serous surfaces. In a case experimented upon it rendered a fetid pleura clean and sweet in a few days. An ethereal solution of iodoform was then substituted for it, under which the fetor returned, to be again as rapidly dispelled by a resumption of the sublimate lotion.

A MAIDEN lady, aged 86, who during five years had been accustomed to eat raw meat, recently expelled by the mouth a worm twenty-seven inches in length. Ten days later one nearly four feet in length, and other fragments, were passed *per ano*.

THAT nitrous oxide is an anæsthetic is disputed by M. Laffont in a recent communication to the Société de Biologie, Paris. He states that it is a most dangerous agent ; that it is not an anæsthetic, but an asphyxiating agent, as MM. Jolyet and Blanche have proved. When it is used to produce anæsthesia, hyperglycæmia and glycosuria result. He has also ascertained that in animals these results ensue before anæsthesia, and during the period of deep breathing.

MR. C. J. BOYD WALLIS, L.D.S.Eng., has been appointed Dental Surgeon to the West End Hospital for Diseases of the Nervous System, Paralysis and Epilepsy.

MR. D. STUART HEPBURN, L.D.S.Eng., has been appointed Dental Surgeon to the Nottingham General Dispensary, *vice* Mr. William Goddard, L.D.S.Eng., resigned.

SACCHARIN is 230 times sweeter than sugar, and is obtained from coal tar. It resembles flour in appearance, but is denser and is dissolved by hot water. As a sweetening agent one ounce will go as far as fourteen pounds of sugar.

A CLERK, until recently employed in the office of the General Council of Medical Education and Registration, has been sentenced to four months' imprisonment for embezzling £5 which had been paid to him as a fee for a certificate of registration. It was believed that the total defalcations amounted to over £500.

A PUBLIC dinner, in behalf of the funds of the National Dental Hospital, will be held at the Albion Tavern, Aldersgate Street, on the 29th of June. Alderman Sir Robert N. Fowler, Bart., M.P., late Lord Mayor, has kindly consented to preside.

DR. SCHILLING records a case in the *Pharmaceutical Journal* in which the injection of six drops of a 20 per cent. solution of cocaine into the gums of a woman aged twenty-eight, to prevent the pain of extraction of a molar tooth, was followed after the extraction by symptoms of which unconsciousness and rigid aspect of the face were the chief. There was contraction of the retinal arteries, as witnessed by the ophthalmoscope. The inhalation of three drops of amyl nitrite restored the patient to consciousness, and it was considered probable that the brain was in the same anæmic state as the retina.

THE main cause of increased electrical tension during thunderstorms, and their greater violence, so that now a greater number of bolts strike the earth than formerly, is said by Dr. Andries to be the enormous increase in the last half century in manufactories, locomotives, &c., filling the air with smoke, steam, and particles of dust of all kinds, the increase of population adding likewise to the impurity of the atmosphere. Having arrived at this point, viz. the enormous increase of foreign particles in the atmosphere, and their wide distribution by various currents of air, he says that the experiments made by himself and others on the subject show that all the electrical phenomena of the air increased in intensity with the increase of dust in it, and to the same cause he attributes the increased appearances of the aurora borealis.

THE Students' Society of the Dental Hospital of London gave their first Smoking Concert of the season on the 22nd March, at the Mona Hotel, Covent Garden. Mr. G. W. Parkinson, M.R.C.S., L.D.S.Eng., was in the chair, supported by Mr. Morton Smale (the Dean), Dr. Dudley Buxton, Dr. Walker, Mr. S. J. Hutchinson, &c. The excellent programme was very creditably given throughout. Mr. McAdam presided at the piano, and opened the entertainment with a finished rendering of the overture to "Zampa." General consent seemed to give the award of merit to Messrs. Lloyd Williams, Fairbank, and Wright for their songs; and Mr. Walter Joyce's impassioned delivery of "William Tell's Ode to Liberty" was worthy of the professional stage. A very enjoyable evening was spent.

MR. HENRY C. SMALE, L.D.S.Eng., of Manchester, passed the required examination, and obtained the degree of D.D.S., of the Pennsylvania Dental College, in February last.

IN his lectures on "Evolution in Pathology," delivered at the Royal College of Surgeons, Mr. J. Bland Sutton, F.R.C.S., said that inflammation, when viewed in the broadest possible light, may be defined as the method by which an organism attempts to render inert noxious elements introduced from without or arising within it. If we summarise the story of inflammation as we read it zoologically, it should be likened to a battle. The leucocytes are the defending army; the roads and lines of communication, the bloodvessels. Every composite organism maintains a certain proportion of leucocytes as presenting its standing army. When the body is invaded by bacilli, bacteria, or micrococci, chemical or other irritants, information of the aggression is telegraphed by means of the vaso-motor nerves, and leucocytes rush to the attack; reinforcements and recruits are quickly formed to increase the standing army, sometimes twenty, thirty, or more times the normal standard. In the conflict cells die and often are eaten up by their companions; frequently the slaughter is so great that the tissues become burdened by the dead bodies of the soldiers in the form of pus, the activity of the cells being testified by the fact that its protoplasm often contains bacilli, &c., in various stages of destruction. These dead cells, like the corpses of soldiers who fail in battle, later become hurtful to the organism they in their life-time were anxious to protect from harm, for they serve as breeding-grounds wherein the bacteria may germinate, and, like a pestilence and scourge, devastate the individual. The analogy may seem to many a little romantic, but it appears to me to be warranted by the facts which I have ventured to place before my audience.

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RETARDED ERUPTION OF THE LOWER WISDOM TOOTH. NECROSIS OF THE MAXILLA.

By CHARLES F. FORSHAW, D.D.S.

THIS is a case alike of importance and interest to the general practitioner as to the dental surgeon. Mrs. W., æt. 59, was, thirteen years ago, on a visit to Blackpool for change of air, and while there noticed a swelling appear outside her left cheek, which, although not causing acute pain, was of sufficient annoyance to trouble her greatly. It remained for a week or ten days, and, after occasional applications of a liniment, then disappeared. For several years it kept appearing, always going again in a short time. One day, however, eight years ago, she mentioned the subject to Dr. Burns, now of Manchester, her then medical attendant, who, after examining the mouth, said that the now increasing tenderness of the part was due to the as yet unerupted tooth, and recommended her to a dentist of good local standing, now deceased. She, however, neglected to follow his instructions as regards consulting the dentist, which resulted four years ago in inflammation of a severe character developing, and at last formed an abscess which discharged through the cheek. The flow of pus, which was enormous, gave temporary relief; but, despite medical treatment for over three years, the sinus continued discharging, and was a source, not only of intense pain, but of personal disfigurement, and caused an impediment in her speech, as of course every time she articulated it stretched the parts, and thus increased the pain. Two years ago, while at Morecambe, she was advised to consult a dentist at Lancaster, who after several efforts failed at extraction, although he said he could feel the tooth, and said that she would have to be operated upon by a surgeon. A short time after returning home, one of her sons happened to have

an accident to his arm, and as his progress towards recovery seemed rather slow, she asked Dr. S., her present medical attendant, if he objected to call in another surgeon to consult with him. Dr. S. offered no objection, and recommended Dr. R. as a likely practitioner. On his seeing her son, and by the advice of Dr. S., she asked his opinion as to her mouth. He advised her immediate removal to the Infirmary, in which hospital she remained from February 19th to March 16th last year. While there Dr. R., assisted by the resident staff, removed a piece of necrosed alveolar bone three inches in length. About a month after this I happened to be visiting the doctor's house when his patient called, upon which he drew my attention to several of her upper teeth, which were loose and in a suppurative condition, and asked for my opinion as to the advisability of removing them. This was the first time I had seen the patient, and did not then know the history of the case. I judged from their appearance that they would be better extracted; a plan in which he acceded. He then advised her to make an appointment with me, and as I was at liberty the following afternoon, I asked her to call on me for that purpose. After making me acquainted with the commencement of her trouble, and giving me most of the details throughout, I thoroughly and searchingly examined the mouth, previous to taking out the teeth. Both the operation of taking out the teeth and examining the mouth was a difficult task, as, owing to the contraction of the masseter and pterygoids, in addition to the still open and running ulcer, she could scarcely open the mouth. Probing through the cheek, along the gum, I come in contact with a hard body deeply embedded in the ramus, which I felt certain was the unerupted wisdom tooth. I, of course, informed Dr. R. of this, and said that, in my opinion, until that was extracted, the ulcer would continue discharging. He then wrote to Dr. S., asking him to send Mrs. W. on a certain day to his house, and also asked me to come at the same time. Accordingly I selected a pair of suitable forceps, and went to perform the operation. The gum and adjacent parts were still excruciatingly painful; the patient could hardly bear the contact of the tongue, and to render her condition worse she was under an attack of severe bronchial affection. In Dr. R.'s presence, in spite of the almost insurmountable obstacle of her being unable to open the mouth above three-quarters of an inch, I succeeded, to my extreme gratification, in extracting the tooth.

The agony of the patient was of course intense; but, to use her own words, the relief, which followed immediately, still greater. The tooth was completely exostosed, the crown almost decayed away, and the roots were not bifurcated. The discharge ceased entirely the following day, the sinus healed up within a week after extraction. In November last I made her an upper and lower vulcanite denture, and beyond a little soreness, which lasted till Christmas, she has made an uninterrupted recovery. I last saw her on April 3rd, when she desired a slight alteration in the lower. She says she was never better in her life. I may add that the cicatrix in her cheek is scarcely visible.

A CONSIDERATION OF THE MERITS AND DEFECTS OF THE VARIOUS METHODS OF PIVOTING.

By W. DOUGAN, L.D.S.I.

Delivered to the Manchester Odontological Society, on December 1st, 1885.

MR. PRESIDENT and GENTLEMEN,—I propose this evening to consider the merits of some of the various methods of attaching artificial crowns to the roots of natural teeth, a process not employed by the general dental practitioner to anything like the extent to which it ought to be applied; and this, I think, is not to be wondered at, as the manner in which this operation is generally performed is exceedingly unsatisfactory, while, when well performed on a sound system, few operations will more delight the patient, seeing that these operations are performed at a time when all hope of saving the natural teeth has fled, and the unfortunate patient believes himself doomed to wear a plate.

The six upper front teeth, the lower canines, the upper and lower bicuspid, are the most favourable for pivoting, and these are the teeth that oftenest require this treatment, as the molars, when largely filled, are but little conspicuous, and the lower front teeth seldom decay; and if they do, it is usually at a time of life when all the other teeth are lost and they themselves are generally loose.

The essentials to a good method of pivoting are that the root shall be permanently protected from decay, that it shall be left reasonably strong, and that the attachment shall be pro-

ductive of no irritation, while, in case of breakage, it shall be capable of easy repair.

Though not absolutely necessary it is extremely expedient that the method shall not depend upon the use of special crowns, but shall permit the use of the ordinary plate teeth. This, I think, everybody will admit, since a pivot tooth should match perfectly, in colour, shape, and size, the natural teeth among which it is placed, and in this country, at the present time, and probably for years to come, manufacturers and dealers will not supply any variety of special crowns, alleging that there is not sufficient demand to justify them in so doing. So the dentist who uses special crowns will generally, after some loss of time, have to use an unsuitable crown, because it is the best he can procure. Another objection to the use of special crowns is that all which I have seen were weaker than metal-backed plate teeth, and in addition their shape or attachment made them large and bulging on the palatal surface, thereby rendering their adjustment with the opposing teeth a matter sometimes of considerable difficulty. These objections do not apply with equal force to bicuspid crowns, because a much smaller variety in size and colour will suffice, and also because sometimes we can use no other crowns.

Now, all the requirements above-mentioned are not satisfied entirely by any one method of pivoting, and we may well employ ourselves in considering the merits and demerits of the principal methods.

(1) As the old wooden pivot has been largely used, and is still used by some operators, we may appropriately begin with it. The method of setting this tooth is so familiar to all that it needs no description from me. Its merits are mainly cheapness, both in time and material. Its disadvantages are those already mentioned as belonging to special crowns: it fails to protect the root perfectly from decay, and the whole operation is weak as compared with some others.

(2) The method of pivoting in general use, which consists in employing the usual plate or tube tooth with wire pivot pin wrapped with silk and gum mastic, fails entirely to prevent further decay, and, on the contrary, rather tends to produce it. While most of us have probably seen instances of such pivot teeth which have endured, in some cases, eighteen or twenty years, the majority last a very short time.

(3) The Bonwill method is so well known that a very brief description will suffice. The root canal is drilled out in excess of the size of the pivot pin used, grooved in its sides, and the orifice countersunk. The root is filled with soft amalgam, into which the flat, saw-edged pivot pin is forced, sufficient being left projecting to enter well into the tooth crown. This latter, which has been previously fitted to the root, is also filled with soft amalgam, slipped over the pivot pins, and forced up to its place, thus making one continuous plug of amalgam through crown and root.

(4) Dr. Storer How has devised four forms of tooth crowns, viz. : a four-pinned and a twin-stapled crown, to be used for front teeth ; a hollow, all-porcelain crown ; and a double-faced convertible crown, having a cuspid face on one side and a lateral on the other. These last two are used principally for bicuspid work. All these varieties of tooth crowns are secured to the root by a special metal screw post. These screw posts are made with a coarse thread, a medium cut between the thread of a screw for wood work and one for metal work. The screw posts are made in three sizes, and are inserted in the roots in the following manner :— After the apical third in the root canal has been filled, the root face is levelled to the gum, countersunk and grooved, in the manner shown in the diagram. The canal is next measured, and the special twist drill inserted in its chuck and allowed to project the measured length of the root canal, which is then drilled out. A special tap corresponding to the size of the drill used is set in the chuck to the same length, and the root is tapped out. The metal screw post is then screwed home, a post chuck being used to avoid injuring the thread of the post.

The twin-stapled or four-pinned crown is then slipped over the screw post, which is bent in whatever direction may be necessary to clear the opposing teeth and adjust the crown in line with its fellows. When the crown has been fitted satisfactorily, the four pins or twin staples, as the case may be, are bent tightly round the screw post, a convenient pair of pliers and an instrument called a crown-mandril being used for this purpose.

The operation is completed by packing amalgam or other stopping in the grooves of the countersunk root face, around the screw post and pins, and to the original contour.

The hollow all-porcelain crowns are secured by filling them

with soft amalgam, and screwing them home with a nut working on the end of the screw post.

The Bonwill, Foster, or the special crowns manufactured in this country by Lemale, may all be attached to the roots in this way. These How screw posts are, in addition, a most effectual means of securing large amalgam fillings in back teeth.

(5) The Buttner method is another modern method, possessing many peculiarities. For its performance a special set of instruments is required, consisting of drills, reamers, and trephines. The operation consists essentially in turning the end of the root perfectly flat and cylindrical, and is accomplished by the above-mentioned instruments, which are worked by the dental engine. The drill is used to enlarge the root canal, the reamer to cut the root face flat, and the trephine to render the root cylindrical below the edge of the gum. A wire is placed in the root canal, and allowed to come through a hole made in the impression cup. The impression is taken, but before removing it from the mouth the wire is taken out through the hole made in the impression cup, and is afterwards replaced in the impression. A brass root model, corresponding in size with the instruments used to prepare the root, is placed on the wire, and the impression cast with it in position. When the model is drawn we place a gold cap on the brass root model, and fit and solder a plate tooth to it. The finished work is secured by driving it on to the prepared end of the root with a mallet. The gold caps are made a little smaller than the prepared ends of the roots, so that they will have to stretch when forced on, and so make a very close joint, which would appear sufficient to prevent further decay.

(6) The Richmond crown is made by fitting a gold cap and pin directly to the root, which root is not prepared by special instruments, as in the Buttner method. It is secured to the root by filling the cap with soft white cement, the surplus of which is forced out when the cap is pressed up to its place.

(7) Dr. Flagg has devised a ready method of pivoting, briefly described as follows:—Select a plate tooth, fit it to the root, and bevel it from near the pins to the labio-cervical edge; solder a platina pin to it as a pivot and back-stay combined. Fill the root, which is enlarged, open-mouthed and undercut, with amalgam, and let it harden for a day. In the root filling drill a hole larger than the platina pin, as near the palatal portion of the filling as

possible, and directed slantwise to the apical portion of root filling; then fissure drill the hole towards the labial portion of filling, trying the tooth until it sets just right, when it is secured by packing amalgam on the root face and palatal face of the tooth.

(8) Dr. Weston's method is practically the same, but he uses a special hollow-backed pin tooth and a special platina pin, and fastens the end of the pivot pin in the root with a little oxyphosphate, afterwards packing gold or amalgam into the enlarged root canal and on the palatal surface of the tooth.

(9) The late Dr. M. H. Webb described a method of pivoting which is for all practical purposes like Dr. Weston's; but Dr. Webb used plain plate teeth, and always built the pivot into the root with cohesive gold, and contoured the palatal surface with the same.

(10) But the method of pivoting which has proved most satisfactory to me consists in fixing a platina tube in the root, and mounting a pivot tooth on that. The tubes and instruments which you see before you are manufactured by Messrs. C. Ash & Sons, from patterns designed by Mr. Balkwill. As success in mounting pivot teeth depends greatly upon accuracy in details, I will describe to you the method which I have myself found most satisfactory.

The first step is to destroy the pulp, if it is not already dead. This is accomplished by exposing it and applying arsenious acid, which I allow to remain in contact with the pulp for about three weeks, at the end of which time the pulp may be removed painlessly and without bleeding. If the pulp is already dead, the pulp canal is cleared and treated with antiseptics in the usual manner. When the parts are restored to health, the apical portion of the root canal is filled with gutta-percha. A pointed roll of gutta-percha is prepared, the pulp canal is filled with chloroform, carried there on wool loosely rolled round a nerve bristle; when the wool is withdrawn, the cold, pointed gutta-percha is immediately carried to the end of the canal and gently packed there. There always remains sufficient chloroform in the canal to effectually soften the gutta-percha and ensure a close fit. Some care is necessary, as it is occasionally easy to force the gutta-percha through the apical foramen. It is most important, in this and every other method of pivoting, that the apical foramen be closed before any attempt at drilling out the root be made, as otherwise

a ledge will be formed, beyond which it will be impossible to carry the filling material, and failure will be the inevitable result.

Generally, the root canal will be filled before the crown is cut off. This is accomplished by nipping off the crowns, if frail, bit by bit; should the operator cut off the crown *en masse*, he ought first always to cut a groove on the labial and palatal surfaces with a small circular saw. The crown being removed the pulp canal is drilled out, the face of the root is countersunk and grooved (in the manner shown in the diagram). The canal is now tapped out with a tap corresponding to the drill used; the groove is cut in the root to make the tube additionally secure, as the thread cut on the tubes by Messrs. Ash is an extremely fine one, and more suitable for holding in metal than in a comparatively soft material like dentine. It would be much better if the tubes were fitted with a coarse thread like the How screws, but when the root has been prepared in the manner described the tubes can be made secure.

The root canal being tapped and cleared from *débris*, the tube screw is now tried to see that it goes nicely up to its place; if it does it is taken out and the tube just allowed to enter the root; the countersunk root is now filled with soft amalgam and the tube screwed home, excess is cleared away and the amalgam allowed to set. If the details have been properly carried out the tube will be fixed immovably, and the root face will be permanently protected from decay.

A tube tooth may now be mounted in the usual manner, if found suitable. But if the bite is close, or the root not in a line with the other teeth, a flat tooth will have to be used, and this should be fitted with a stout backing, covering the entire palatal surface of the tooth and coming well up to the cutting edge. This is done that the opposing teeth may bite upon the metal instead of, as we often see, upon the unprotected mineral. A piece of extremely thin platinum or dental alloy plate is now fitted into the root, and a hole made in it for the pivot-pin to come through. I prefer gold wire alloyed with platinum for the pivot. The pivot-pin is left long to enable the operator readily to withdraw the appliance, and it is generally necessary to bend the pivot-pin and grind a slot in the mineral tooth at the palato-cervical edge to render it easily adjustable. The tooth, base-plate, or cap and pivot-pin are fastened together with a mixture of wax and resin, adjusted in the mouth,

invested in plaster, and soldered. Before placing the finished work in the mouth a thin disc of soft warm gutta-percha is placed between the cap and the root, and the tooth pressed into position, taken out and excess of gutta-percha cleared away. The pivot-pin is now barbed or ragged with a sharp knife, and forced home, considerable pressure being employed in doing so. It will be found sufficiently firm for all practical purposes, while it can be removed, if necessary, without much difficulty. This method is applicable to the six upper front teeth, the lower bicuspid and canines, and sometimes to the second upper bicuspid.

Methods of lining the root with tubes have been often described, some operators using square pivot-pins to prevent lateral movement, but round ones are stronger, more convenient and abundantly firm. In some cases a bridge may be mounted with these tubes, but only one pin may be soldered to the bridge, since if two or more are attached it will be found impossible to get them into the tubes, as they invariably point in different directions. The rest of the pins for attachment must be headed and passed like nails into the tubes, either through holes prepared for them in metal block teeth, in the case of a molar or bicuspid, or through holes made in the plate at the back of the front teeth, in the case of incisors.

Comparing the respective merits of the methods just described, we find that the Bonwill effectually preserves the root from decay. The operation is readily performed, requiring but little time. The objectionable features are—1st, weakness of the root by reason of the excessive drilling out; 2nd, the mineral crown is weak, and has all the disadvantages already enumerated as pertaining to special crowns. In the How method the attachment of the screw post to the root is as perfect as any method depending on a central pivot-pin can be, but, as you may see from the specimens before you, the How four-pinned crowns are so exceedingly frail as to be almost useless. Nevertheless, the method has great value, for these How screws, when fitted with nuts, are a most efficient means of fastening the all-porcelain crowns, manufactured by Lemale, and these, either for front teeth or bicuspid, are in point of strength very satisfactory. The Buttner method is the strongest ever devised or possible for attaching a crown to a root. It is only objectionable because the ferrule or cap is considered to irritate the periosteum, in addition to robbing the root of a portion of its attachment. All these objections apply equally to the Richmond

method, which has the further disadvantage of depending upon the use of the perishable white cements. The Flagg, Weston, and Webb methods will all protect the root from decay, but are objectionable because the root canal must be considerably enlarged in order to pack the filling material round the pivot-pins, and in all three should the porcelain break the operation will have to be repeated *ab initio*. But of all the methods described none combine so many points of excellence as the tube and central pivot-pin. The root is as perfectly protected from decay as in any other; less substance is removed from the root than in any other method depending upon a pivot-pin, with the exception of the How, while, if not so strong as the Buttner or Richmond methods, this method maintains the attachment free from the objection of irritating the periosteum. Plate teeth are used, and can be placed in any required position, without regard to the position of the root, and should the porcelain be broken (and when the tooth is properly backed this is less likely than in most methods) its repair is an easy matter. It has one fault: should the pivot-pin break in the tube its removal is difficult, but this objection applies equally to most other methods. Many operators have condemned screws used in dentine, but this is because the screws have been made with too fine a thread, and while the tubes shown you would be better if made with a coarse thread like the How, if the root is prepared in the manner described and shown in the specimens, it will be found impossible to remove the tube without cutting it out or breaking the root.

There are many other methods of pivoting teeth, but none of them are possessed of any special merit; and judging from the past it is probable that many forms of tooth crowns and methods of attachment will yet be devised, but that they will be better or differ radically from those described in this paper I think most unlikely, inasmuch as there appear to be but two ways possible of securing a crown to a root—either with a band or ferrule, as in the Buttner and Richmond, or with a central pivot-pin, which may be a screw, either hollow or solid, as in the How, or simply cemented into an enlarged root canal, as in the Bonwill, Webb, Weston, and other methods.

RELATION BETWEEN FACIAL NEURALGIA AND DENTAL IRRITATION.

By J. M. ACKLAND, M.R.C.S., L.D.S.Eng.

IN the February number of this journal (*Provincial Medical Journal*) is a paper by Mr. H. Boyle Runnalls on the subject of facial neuralgia, wherein he gives his experience, as a surgeon in general practice, of cases of so-called facial neuralgia, where a great amount of medicine has failed to give relief, but in which attention to the teeth has been rewarded by a speedy cure. I can endorse much of what he says from cases which have come under my care as a dental surgeon, both in private and hospital practice. One has only to remember the important part played by the fifth nerve, with its wide-spread divisions and branches, in the nervous supply of the face and deeper tissues, also that many of the ultimate ramifications of this nerve end in the very teeth themselves, to see how easily these dental organs can, when diseased, produce pain in the surrounding parts. Again, how very intimately this nerve is connected with others, by its ganglia, each of which has its sensory, motor, and sympathetic root. Facial neuralgia, arising from the teeth, may be either *reflex*, *direct*, or *complex*. In the *first* case some portion of the nervous system receives an exaltation of function from the tooth nerve. In the *second*, some contiguous nerves are involved by the spread of inflammation from diseased teeth. In the *third*, both would be entailed in a mixed and uncertain proportion. In facial neuralgia it is generally found that pressure on the points of exit of branches of the affected nerve from their bony canals, such as the infra-orbital, mental, &c., is extremely painful. One of the most constant sources of neuralgia is the wisdom tooth, which so often becomes impacted, or from other causes unerupted, and thus, from pressure, on the nerves, &c., produces the most intense pain. This is, in many instances, relieved by free incisions over the buried tooth, whilst in other cases further treatment is necessary. I remember being consulted, some six months ago, by a young married lady, twenty-six years of age, whose lower wisdom teeth were impacted, and, as no other treatment gave any relief, and the second molars were in a good condition, I, after no little difficulty, extracted both wisdom teeth under chloroform; the neuralgic pains which had hitherto troubled her stopped at once.

The wisdom teeth of the lower jaw very frequently gave rise to otalgia; and I could cite not a few instances in which their extraction has effected a complete cure. Many cases of so-called earache are doubtless examples of neuralgia affecting the auriculo-temporal division of the inferior maxillary nerve. Odontalgia, or toothache, and the neuralgic pains which often accompany it, finds its most frequent cause in exposure of or pressure on, the tooth pulp; and, what is often embarrassing even to the most experienced dental surgeon, is the transference of the seat of pain so frequently met with, often to the fellow tooth of the opposite jaw, and now and then to more remote parts of the body, which Brunton accounts for by the irritation conveyed to the centres of sensory branches of the fifth pair, being transmitted to those of the vaso-motor centres, from which they are not far distant, and thus the blood-vessels in distant parts become affected.

The formation of secondary dentine (and hence pressure on the pulp), and exostosis of the fang give origin to the most acute neuralgic pains. In these cases the pain is reflected from the spot of irritation over a large nervous area; but the tooth containing the offending growth is usually perceptible by tenderness or elongation. Where it arises from an exostosis it is apt to be repeated with several teeth. These cases are not at all uncommon, and are often made the subject of unavailing medical treatment for a long time. Again, overcrowding of the teeth frequently causes facial neuralgia; and among the nerves of special sense which have been affected by reflex action from tooth-irritation are the auditory and optic. Indeed, time and space would fail me in mentioning the various neuralgic affections which have been proved conclusively to arise from some affection of the teeth; and, whilst I am convinced that many patients are allowed to suffer longer than they ought because their teeth are not examined and attended to, I am equally certain that many serviceable teeth have been sacrificed without alleviating, in the slightest degree, the oft-times terrible agony of facial neuralgia. It must not be forgotten that any irritation to a portion of a sensory nerve, in its passage to the brain, will cause pain which is referred to the peripheral extremities of the fibres irritated; hence there may apparently be pain in teeth which are in no way the cause of it. Sometimes, however, the extraction of a tooth will temporarily stop the pain, which soon returns as bad if not worse than before. It is probable

that in these cases the extraction of the tooth has led to the stretching of the nerve, and thus afforded relief for a while. Mr. Runnalls gives, as his experience, that *every* case of "neuralgia" not due to a nerve implicated by growth, carious bone, or scar, is the result of dental irritation; but I think he has omitted to name one all-important factor.

The late Dr. Anstie, in his excellent work on "Neuralgia and its Counterfeits," says, "It is universally the case that the condition of the patient at the time of the first attack is one of debility"—and here undoubtedly is a cause of facial neuralgia, in which the teeth, be they ever so affected, may play a very secondary part, as also in those who are the subjects of rheumatism, gout, &c. Some months ago I was earnestly entreated by a lady to extract an upper molar tooth which had a small stopping in it; but after trying the usual tests of heat and cold, percussion, &c., I felt convinced that the tooth ought not to be removed then at any rate, more especially as the patient, who had been anxiously watching a sick daughter for many nights, was much below par: grain doses of the sulphate of quinine and a few glasses of port wine entirely removed the pain, which the patient said arose from the tooth.

Dr. Charlton Bastian, on Diseases of the Nervous System, in "Quain's Dictionary of Medicine," shows in discussing the ætiology and pathology of the subject, how an altered condition of the blood, say in anæmia, may produce a diminution, exaltation, or other perverted action in a nerve, especially in those of a neurotic habit, whilst Dr. Buzzard, on the subject of tic-douloureux in the same work, says, "Cold wind, especially with a moist atmosphere, has an undoubted influence in starting neuralgia of the fifth pair, the unprotected condition of the face explaining probably its peculiar liability to be so attacked. There appears reason to think, however, that when damp with cold excites an attack of neuralgia, there must be at the same time a peculiar condition of the system. . . . Such a condition is probably of a rheumatic or gouty nature, and the cold seems to start a subacute neuritis in the sheath of the nerve." And cases are common in which facial neuralgia occurs more or less regularly in females at the menstrual periods, or during pregnancy.

Mr. Runnalls mentions one or two cases of facial neuralgia, then goes on to talk of amaurosis, and finally gives instances of

pain arising from teeth which had been stopped. Possibly (and this sometimes happens to the best of practitioners in spite of all their precautions) a filling had been placed too near the nerve, resulting in the death of the latter; or a small particle of septic matter had escaped attention in the preparation of the tooth. Be that as it may, the pain is in the majority of cases of this description instantly relieved by a very simple operation, that of drilling a small hole at the neck of the tooth underneath the edge of the gum into the pulp chamber, and so giving free exit to the gases and fluids which have been generated by the death of the pulp. In other cases the filling may be taken out; the nerve canal thoroughly cleaned, treated, and refilled.

Cold or violence, rheumatism or syphilis, may cause a similar result in a perfectly sound tooth, an embolism being formed in the nutrient vessels of the pulp. This state of things is generally associated with periodontitis or inflammation of the alveolo-dental membrane (for branches of the same vessels supply pulp inside and membrane out), the pathology, &c., of which would be too long to enter here, even were it the place for so doing. Suffice it to say that unless this condition is diagnosed and successfully treated, it passes through various stages and ultimately ends in abscess, as it appears to have done in a case mentioned by Mr. Runnalls. Now this may often be relieved by giving the pus vent either through the tooth as mentioned above, or where the abscess points (generally on outside of alveolus) and then treating in various ways. These troubles often occur in connection with front teeth, and there is frequently no more reason for sacrificing the tooth in spite of its bony surroundings than there is in the majority of cases of whitlow for amputating the finger. The relief experienced when an exit is made for the pent up fluid is as complete in one case as the other. Some few weeks since a medical friend called late one night requesting me to do anything I could to relieve him of the terrible pain he had been for many days suffering in nearly all his front teeth, as the result of exposure during the late severe weather. All his teeth were sound, but his sufferings were so great that he offered to lose any of them to be free from pain. Although he had allowed some considerable time to elapse before coming to me, I prevailed upon him to try a little longer. Nothing, however, seemed able to arrest the inflammation, which ultimately ended in the death of the nerve of the lower

right central tooth; the tension, and with it the pain, in which was immediately relieved by a hole drilled as before-mentioned. I trust I shall not be considered egotistical, this is but one of many instances; but their treatment seems to me to be purely a matter of dental surgery, and my only object in mentioning it is to show that cases of the kind are to be treated easily and successfully, and yet such a wholesale extraction avoided. Difficult as it is, in many instances, to diagnose the cause of the pain, a well-marked case of facial neuralgia accompanied by any other trouble differs in many ways from that of a collection of pus as described by Mr. Runnalls, or in other words an abscess; the history as well as the appearance of the two cases would vary considerably, and this would help one to diagnose the cause of the mischief. On the other hand, there are of course cases just as difficult as these would be easy, and in which extraction is an absolute necessity. No one would deny the *right* of any surgeon to take upon himself to decide for his patients what teeth are to be preserved and what extracted, and without further ado removing the latter; but many, I am sure, would question the wisdom of such proceeding, especially in these days of conservative surgery, no one branch of which has made more advancement than that of dental surgery.

Mr. Runnalls remarks, and very truly, that the teeth of the present generation are in a far worse condition than those of the last, and still seem to be degenerating. Is not this another reason why the teeth, bad as they may be, should be preserved as long as possible? Besides, what does this continual extraction mean? Merely a substitution of dyspepsia for neuralgia. In conclusion, whilst in the main I can endorse much of what this gentleman says on facial neuralgia and its connection with the teeth, his attempt to pose as a critic in dental matters must be allowed to pass for what it is worth, for no one but those who have thoroughly studied the teeth and their diseases can, in the face of the difficulties which are so constantly met with, be possibly able to give any reliable advice thereon; and in the present day there is every opportunity for patients of all classes, either in private or hospital practice, to be relieved from pain arising from dental troubles, and at the same to have *trustworthy* advice as to what teeth should be sacrificed, and what treated and preserved.

ODONTO-CHIRURGICAL SOCIETY OF SCOTLAND.

THE Annual Meeting of this Society was held at 30, Chambers Street, Edinburgh, on the 12th of March, Mr. W. BOWMAN MACLEOD, L.D.S.Edin., President, in the chair.

The Treasurer, Mr. MALCOLM MACGREGOR, reported an income of £29 13s. 6d. derived from subscriptions, entry-money, and the interest on the bank account. This, with a balance of £10 14s. 8½d. carried forward from the previous year, and a deposit receipt of £95, made a sum total of £135 8s. 2½d. After the deduction of expenses, a balance of £2 1s. 0½d. was left, which, with the deposit receipt above referred to, gave £97 1s. 0½d. as representing the total funds of the Society.

On the motion of Mr. CAMPBELL, seconded by Mr. SHIACH, the present office-bearers of the Society were re-elected for the ensuing year.

The PRESIDENT then called upon Mr. CORMACK for his paper upon:—

THE MUCOUS MEMBRANE OF THE MOUTH,

WITH SPECIAL REFERENCE TO ITS PHYSIOLOGY AND PATHOLOGY, AND THE PART PLAYED BY ITS SECRETIONS IN THE PRODUCTION OF DENTAL CARIES.

By EDWIN A. CORMACK. L.R.C.P. & S., L.D.S.Edin.

The subject of the mucous membrane of the mouth is an important one, the whole significance of which has been greatly underrated by the dental profession till within the last few years. In the opinion of many eminent observers its secretions are important factors in the causation of dental caries.

To understand the rationale of their operation we must possess a correct knowledge of the connections of the mucous membrane with other parts, its functions and the agencies which its secretions are subjected to in the mouth. In order to fulfil this object systematically we will discuss in succession its anatomy, physiology, and pathological anatomy. The special diseases of the gum I have reserved for discussion at a future period.

Having referred to the anatomy of the mucous membrane and the gum, of the PHYSIOLOGY the author says:—The mucous membrane yields a secretion—mucus. The mucus is derived from certain of the epithelial cells which elaborate it within their protoplasm and then extrude it.

Lymphoid elements also escape from the mucosa, and passing through the epithelial cells, reach the surface and form the swollen spherules known as mucus corpuscles.

Mucus is a colourless viscous fluid. It contains the debris of shed epithelium, mucus corpuscles, and mucin.

Mucus corpuscles are nucleated masses of protoplasm, similar in size to white blood corpuscles, but containing, unlike the latter, one or more nuclei. Even at the normal temperature, they exhibit amœboid movements. These cells are probably modified epithelial cells of the columnar variety. Mucin is an albuminoid substance that occasions the viscosity of mucus fluids; it thereby facilitates the passage of food over mucous surfaces. It is not coagulated by heat, but is precipitated by alcohol and acetic acid. The precipitate is not soluble in excess of the acid. The precipitate swells up in water, but is not dissolved in it; it is, however, readily soluble in alkalies.

Mucin is largely produced in the mucous glands, and in the secreting cells of the salivary glands, especially in the sub-maxillary and sub-lingual. Mucin, in composition, differs only from albumin in containing no sulphur. Albuminoids contain C. H. O. N.; like proteids, they yield leucin and tyrosin, one or both, when subjected to hydrolytic treatment. Albuminoids readily decompose into a number of simpler bodies.

GENERAL PATHOLOGY OF MUCOUS MEMBRANE.

The diseases of the mucous membrane of the mouth are generally of an inflammatory character, and are most common in childhood, resulting usually from intestinal disorders, bad hygiene, and want of local cleanliness.

Inflammations may also be induced by noxious substances acting on the external surface of the membrane. The intensity, extent, and duration of the inflammations vary greatly; and a number of different forms are distinguished accordingly.

Inflammations may be divided into acute and chronic, and, according to their character, into catarrhal, croupous diphtheritic, and gangrenous.

Hyperæmia is very commonly met with in the mouth—where it is of long standing, it may be referred to the atonic condition of the walls of the blood-vessels from malnutrition. The mucous

membrane becomes intensely reddened, and, at the same time, the secretion is increased.

In catarrhal inflammations, the characteristic feature is a morbid increase of the secretion of the membrane. The catarrhal secretion is furnished partly by the blood-vessels and partly by the epithelial cells. There is an exudation from the capillaries of liquor sanguinis, containing numerous white blood corpuscles. This exudation is always mingled with secretions from the epithelial cells. These cells normally produce mucus from their protoplasmic contents, the columnar cells chiefly; in catarrh this is much increased. Great quantities of glassy mucus are thus deposited on the membrane along with the normal secretion of the mucus glands.

The inflammation may now subside, and the membrane recover. But should any further irritation arise, other changes will take place. The epithelial cells begin to be shed, and secretion is rendered turbid by their presence, then we have what is termed epithelial catarrh.

In the later stages, there is an excessive desquamation of the epithelium and an abundant extravasation of the white leucocytes. Many forms of catarrhal inflammation are thus characterised by an almost purulent secretion, and are described as purulent catarrh.

Catarrhal inflammations are usually transient; sometimes, however, the process becomes chronic.

In addition to the alterations in the secretion and the epithelial cells, there is an infiltration of cells into the mucosa, and sometimes into the sub-mucosa. Where the epithelium has been lost by desquamation, repair is effected by multiplication of the remaining epithelial cells.

The inflammation may, however, become intensified, so that the tissues perish over some considerable extent. When the infiltration is extreme, the tissue perishes by necrosis. In this way ulcers are produced. The lymph follicles are often the seat of inflammation and ulceration. Ulcers starting in them are known as follicular ulcers. When catarrh passes into ulceration, the inflammatory exudation usually extends far beyond the limits of the ulcer.

When the inflammation is of long duration, a certain amount of fibrous hyperplasia takes place. The openings of the glands

often become obstructed, and they are thus distended into cysts.

INFLAMMATORY AFFECTIONS OF THE MOUTH.

The slightest degree is known as *Erythema*. It is characterised by redness, sense of heat, and sometimes considerable tenderness, but is not usually attended with acute pain. This may rapidly disappear or pass into the more severe form known as

Catarrhal Stomatitis. In this form the surface is intensely red, the secretion of the membrane is increased, and the epithelium desquamates. Over the surface of the gums, lips, and cheeks, the redness and swelling are generally uniform, but in the hard palate they may appear in streaks and patches.

When the inflammatory exudation is abundant, clear vesicles are sometimes formed on the tongue, lips, and cheeks, where the epithelial covering is thicker than elsewhere, and prevents the free escape of the exuded liquid. As the vesicles break, small ulcers, covered with a whitish film of detritus, may be formed in their place. The mucus glands become swollen, giving rise to greyish or greyish-red elevations surrounded by a reddened areola. When the duct becomes obstructed with mucoid cells, the gland may be dilated into a tiny cyst by the retention of its secretion.

The catarrhal secretion contains at first few cells, but later the proportion becomes increased. The cells are in part extravasated leucocytes, in part desquamated epithelial cells. If the latter remain on the surface they may accumulate so as to form a whitish or discoloured grey and brown deposit or fur.

When the gums are involved they swell and rise up between the teeth, around the necks of which they ulcerate. In some cases this ulceration does not cease until it has extended into the alveoli and destroyed altogether the connections of the teeth, which become loosened and fall out.

Catarrhal stomatitis is generally the result of some mechanical or chemical irritation of the mucous membrane; when the irritation is local, like that caused by a carious tooth, the stomatitis is likewise local. There are many diseases which set up inflammation of the mouth. In measles a mucular eruption appears, in scarlet fever a punctate, or diffuse scarlet eruption. In small-pox, chicken-pox, pemphigus, and in foot-and-mouth disease there are eruptions of vesicles and pustules, which pass through the same stages as those of the skin.

Simple catarrhal inflammation frequently occurs during the period of dentition, when it is often accompanied by fever.

Erysipelatous inflammation may extend from the skin to the mouth, or may begin in the mouth, caused by the direct action of irritant bodies, as by scalding drinks, acrid or corrosive substances taken into the mouth. It is characterised by livid redness and much swelling, and sometimes even vesiculation. The tongue is the part most affected.

Apthous Stomatitis is distinguished by the appearance on the catarrhal mucous membrane of small whitish or slightly yellowish patches (apthæ) from the size of a millet seed to that of a pea.

They are surrounded by a livid border and may coalesce into larger patches. These apthæ consist of a solid exudation lying between the fibrous tissue and the epithelium—(Böhn). The exudation may be re-absorbed and the apthæ then disappear, or the epithelial covering is broken through, the fibrinous film exposed, and gradually separated by the growth of epithelium advancing beneath it from the margin.

As the epithelium is reproduced simultaneously with the separation of the fibrin, no ulcers are in general produced. The eruption occurs in successive crops, and may thus be kept up for weeks.

It occurs chiefly in children who are teething. It also occurs in connection with sore throat, pneumonia, gastric catarrh, the acute exanthemata, diphtheria, ague, whooping-cough.

This affection has no connection with any invasion of fungi.

Ulcerative Stomatitis is an affection which always starts from the alveolar margin of the gums—(Böhn). It begins with redness, swelling, and loosening of the gums around the teeth. The alveolar border becomes rounded and swollen, with blunt processes rising up between the teeth. Hæmorrhage is not uncommon at this stage. In the second stage the margin of the swollen gum becomes discoloured, and the tissue softens and breaks down into a yellowish friable mass—ulcers are thus formed, which rapidly deepen. The ulcerative process may extend directly to the contiguous parts of the cheek and gums, and may work downwards till it attacks the periosteum of the bony structures, leading to necrosis.

The affection is usually acute—children are especially liable to it. It attacks people who are badly nourished or debilitated by disease, such as scrofulous disorders, intestinal complaints, typhoid,

diabetes, or scurvy; damp, cold, and impure air favour its appearance.

Local irritations may lead to it, as in cases of chronic poisoning by mercury, phosphorous, lead, and copper. The form, which is due to long continued phosphous poisoning, is apt to extend deeply into the tissues, and so give rise to periostitis and necrosis of the bones.

Noma or cancrum oris is an allied but more severe disease. It may begin as an ulcerative disease, or appear independently. In the former, the disintegration of the tissue of the gums extends rapidly, and the tissue breaks down into a pulpy gangrenous mass.

In the latter, the first symptom is the appearance of a livid swelling on the inner surface of the cheek, near the angle of the mouth, accompanied by the free flow of foul saliva; a patch of greyish yellow infiltration then appears, and this speedily breaks down and becomes gangrenous.

As the disease progresses, a purplish spot appears on the outside of the cheek, this becomes black, and gangrene sets in and spreads. It is generally confined to one side. Once the gangrene has commenced, it may spread to a considerable extent, advancing very rapidly: noma is generally fatal. It attacks poor and debilitated children, usually between the ages of two and twelve.

Suppurative inflammation of the mucous membrane of the mouth and partly underlying it should be distinguished from ulcerative stomatitis and noma. It may affect any part, but appears most commonly in the tongue and gums. In the latter, it frequently arises in connection with carious teeth. The gum becomes red and swollen, and, presently, pus forms beneath the surface. This is termed a gumboil.

Croupous Stomatitis.—When the mucous membrane is so injured that its epithelium is destroyed here and there, and its blood-vessels so much injured as to allow of free exudation of their contents, coagulation of the latter may take place. This forms a false membrane, consisting of fibrinous filaments and granules, beset with pus cells or of shining homogeneous blocks representing cells that have undergone coagulative necrosis.

The false membrane is connected with the underlying structures by fibrinous filaments; but can be readily pulled off, showing the reddened surface of the mucous membrane beneath. To produce

coagulation, the exudation must be of an inflammatory nature and the cells necrotic.

Diphtheritic Stomatitis.—When a mucous membrane is injured in such a way that its epithelium dies without desquamation, while its blood-vessels are damaged and pour out an abundant exudation, it sometimes happens that the dead epithelial cells become saturated with the exuded liquid, and then pass into a peculiar condition of rigidity resembling coagulation.

The seat of this change appears as a dull greyish raised patch, surrounded by red and swollen mucous membrane. The exudation is rich in albumen, and the cells take the form of a kind of coarse network. The sub-epithelial areolar tissue is beset with filaments of fibrin and leucocytes. Hæmorrhages are not uncommon.

Inflammations of this kind, in which the tissue itself coagulates into a solid mass, are called diphtheritic: and when the necrosis and coagulation extend only to the epithelium the affection is called superficial diphtheritis. Inasmuch, then, as the croupous membrane consists essentially of coagulated exudation, croupous inflammation is at once to be distinguished from superficial diphtheritis, in which the epithelium coagulates *en masse*.

Deep or parenchymatous diphtheritis is characterised by the coagulation not merely of the epithelium but also of the underlying connective tissue.

Wedl states that this affection gives rise to a general inflammation of the root membranes over the whole row of teeth in the upper or lower jaws.

“Croupous inflammation of the gum is an affection of considerable importance, both on account of its sudden occurrence and also because it is liable to assume a diphtheritic character.”

“In the first stage the edge of the gum is covered with a whitish-grey membraniform exudation. . . . The mucous membrane deprived of its epithelium is slightly swollen, tender to the touch, and bleeds easily.” Generally the exudation appears upon the margin of the lower jaw which faces towards the lips and cheeks, whence it spreads gradually over the whole anterior and posterior edges of the gums. The exudation degenerates very rapidly into an offensive, sanious mass.—(Wedl.)

PARASITIC AFFECTIONS.

The oral cavity is always infested by a multitude of vegetable

micro-parasites which gain entrance to it from without, and find in it a fitting soil for their growth.

Moulds, yeasts, and bacteriæ are all met with; of the latter micro-cocci and sarcinæ occur, as well as bacilli and spirilla. Where cleanliness is not observed, they may occasionally set up putrefactive decomposition. Measles, scarlatina, small pox, diphtheria, &c., all give rise to inflammatory conditions of the mouth; and as we regard these diseases as due to micro-parasites, we must assume that the corresponding pathogenous organisms gain access to the tissues of the mouth.

Saccharomycis albicans—muguet, or thrush fungus—is a special fungus of the mouth, generally referred to as *Oidium albicans*. It is one of the yeasts, and is therefore akin to the *mycoderma vini* (mother of vinegar) or *saccharomyces cerevisiæ*. The scum which forms on the surface of alcoholic liquors, and leads to their transformation into vinegar, contains this yeast fungus—the mother of vinegar. Yeast cells not only set up fermentation directly, but they yield an unorganised ferment which changes cane sugar into grape sugar.

They have no power of invading living tissue and are of little pathological importance, as it is only under specially favourable conditions they are able to grow freely. There is usually no great supply of fermentable saccharine matter available for them. The presence of acids does not check their development. Although probably always present in the mouth, the sub-epithelial tissues are only invaded when by antecedent changes, constitutional or other, the resisting power of the tissues has been considerably diminished. As it occurs in the mouth, it assumes the form of rounded or oval cells, seldom filaments. It gives rise to minute, whitish, slightly raised specks on the mucous membrane. They are generally to be found on the inner surface of lips and over the tongue. As they grow they coalesce into whitish films. After a time the film is cast off, the surface beneath appearing red and sometimes eroded. The fungus grows mainly in the middle layers of the stratified epithelium. From this position the fungus may penetrate into the deeper layers and reach the fibrous structure. Its progress downwards is marked by inflammation.

Thrush is a disease which manifests itself in very young children, and in adults debilitated by exhausting diseases. Its growth

is favoured by the use of cows' milk or starchy food, and by imperfect cleansing of the infant's mouth.

HYPERTROPHY AND ATROPHY.

The epithelium of the mouth is constantly being shed and continually renewed by regenerative multiplication. In catarrhal affections this shedding is a prominent feature, and deposits are formed on the surface of the mucous membrane. This deposit is added to by the remains of food and by rapidly growing fungous parasites. In this way a continuous film or fur is produced.

Hyperplasia of the connective tissue is due either to some chronic inflammatory cause or to congenital conditions.

Inflammatory hyperplasia is most commonly met with in connection with the gums. It gives rise to circumscribed tumour-like thickenings.

Atrophy of the gums and of the alveolar parts of the jaws is apt to follow upon the loss of the teeth, and is normally present in old age.

The results, then, of our investigations into diseases of the mucous membrane show that they are for the most part of an inflammable character, caused in some cases by direct action of irritants taken into the mouth, in others by disorders acting initially at more distant parts of the alimentary canal. We have also seen that the characteristic eruptions of the exanthemata make their appearance in the mouth; that a weak habit of body predisposes, and that malnutrition and bad hygiene are important factors in their causation. Parasites also contribute their evil influences.

Inflammation, if slight, increases the secretions; if more severe, it impairs the vitality of the mucous membrane by desquamation of its epithelium and interruption of its functions. It may destroy the epithelial covering, and even the underlying tissues, by infiltration, ulceration, or necrosis.

By infiltration or by hyperplasia it may produce obstruction of the gland ducts, and consequent cysts; or, where the processes are excessive, total obliteration.

INFLUENCE OF THE SECRETIONS OF THE MUCOUS MEMBRANE ON THE PRODUCTION OF CARIES.

From the earliest times the causation of caries has occupied the attention of those who devoted themselves to dental pathology.

Since the time of Vespasian (90—120 B.C.), when Aretæus confessed that “the cause of toothache is known only to God,” many investigators, more enterprising than he, have made innumerable observations and propounded theories more or less satisfactory. It was known about the beginning of this century that certain acids found in the mouth were capable of decomposing the teeth; but caries was generally believed to be due to some inflammatory agency situated within the tooth, hence the term *caries interna*.

In 1835, Robertson of Birmingham considered that caries was due to “the corrosive chemical action of the solid particles of food which had been retained, and have undergone a process of putrefaction or fermentation in the several parts of the teeth best adapted for their reception.” Since then numerous theories have been advanced. Mr. Tomes, in 1859, advocated the chemico-vital theory. He believed that acids, whose origin he referred to the mucous and saliva, resolved the tooth into its histological elements, and that the dentine exerted a resistive force, or alternatively, that caries was to some extent inflammatory.

Magitot, in 1869, elaborated the theory of resistance and consolidation of dentine, but eliminated the idea of inflammation.

The year after, Leber and Rottenstein demonstrated the presence of leptothrix granules in the dentinal tubes. Hence they denied the reaction of dentine. To caries of the enamel they ascribe a chemical cause.

In 1870 Wedl verified part of Leber and Rottenstein’s experiments, but considered acid essential to the disease. He believed caries to be due to abnormal secretions of the oral membranes and salivary glands; and that in consequence of their fermentations, acids were formed which acted on the teeth.

In 1873 Tomes abandoned all idea of vital action as a part of caries, and regarded the calcification of the fibrils as doubtful.

In 1881 Underwood and Milles believed the disease to be due to micro-organisms; also that previous experiments showing caries to be due to acids were void, because septic conditions prevailed.

In 1882, Miller, of Berlin, demonstrated that micro-organisms do not precede decalcification, but that they are the cause of the disintegrations of the matrix after the removal of the lime salts by acids.

Mr. Mossman, of Iowa City—from whose articles on Dental Caries, published lately in the *Dental Cosmos*, most of the above

account of the history of the different theories has been taken—sums up as follows:—

The vital or inflammatory theory of caries, an inflammatory disease having a central origin.

The chemical theory recognised the existence of acids in the mouth and their capacity to dissolve the lime salts.

The chemico-vital theory is a combination of the two above mentioned. According to this belief the acids act upon the inorganic tissues; the irritation is conveyed to the pulp, which reacts against the invasion of the disease by throwing out lime salts into the fibrils.

The parasitic theory. The enamel being removed by acids, the organisms penetrate the tubuli of the dentine and proliferate there, according to some writers, merely expanding the tubuli for the better penetration of acids, and, according to others, generating themselves an acid by their action upon the organic matter.

The chemico-parasitic theory. This gives to acids the first place, to their agency all decalcification is due. Following this process come the micro-organisms, which penetrate only when decalcification is sufficient to permit their advance. Then they are found in great numbers, and cause the putrefaction of the organic mass.

The chemico-putrefactive theory is the same as the above, save that the micro-organisms are only incidental to the putrefactive process, and have no part in the disease.

Messrs. Underwood and Milles describe the microscopical appearance of carious dentine as follows:—

“The tubes are filled with micro-organisms. They appear to penetrate the canals at first in single file, and then accumulate in vast numbers to encroach upon the matrix. Here and there a narrow line of bacteria or micrococci penetrate beyond the sphere of visible decay. Besides the disintegrated tissues and foreign particles, there is found abundance of *leptothrix buccalis*.

“The micro-organisms consists of micrococci, rod-shaped and oval bacteria, and short bacilli.

“The number of sections of carious teeth cut and examined is now so enormous, that observers feel justified in assuming that the presence of micro-organisms is indispensable to the process”—(Sewill). Acids are necessary for the primary decalcifications.

The sources of these acids may be referred to the processes of

fermentation and putrefaction, which are continually going on in the mouth.

Fermentation requires the presence of a ferment, which may be either organised, that is, living, or unorganised. Living ferments grow and multiply at the expense of the matters in which they occur. Yeast may be cited as an example of the former, and ptyalin of the latter. Moulds, yeasts, and bacteria, are all met with in the mouth. They gain access to it from without (Ziegler).

The mucous secretion and the secretion from the salivary glands combine to form mixed saliva. All starchy or saccharine substances taken into the mouth are converted into grape sugar by ptyalin.

Grape sugar, when acted upon by a yeast, the torula, undergoes alcoholic fermentation; the presence of the bacterium aceti induces acetous fermentation. Stomatitis and caries of the teeth have been observed to be especially frequent in the case of chronic drunkards, and it is probable that beer drinkers suffer more from these affections than those who indulge in liquors possessing a larger percentage of alcohol. May not the acetous fermentation of the imbibed liquor cause these conditions? Another yeast, the myco-derma vini, transforms the alcoholic products of the first torula fermentation into acetic acid.*

Milk is taken as food, acted upon by the bacterium lactis, lactic acid is produced.

Putrefaction also requires the presence of a ferment, and we know that the bacterium termo is that ferment—(Ziegler). Naegleli, Pasteur, Lister, and others, regard putrefactive fermentation as the direct result of the vegetation of the bacteria. Bacteria, as they grow and multiply, withdraw from the nutrient liquid the elements they require for building up their cells. These are chiefly C. H. O. N. from carbohydrates and albuminoids. The necessary inorganic compounds are derived from salts containing sulphur, phosphorous, magnesium, and potassium. None of the bacteria can develop without water—(Ziegler).

When albuminoids undergo decomposition, we have formed formic, *acetic*, butyric, valerianic, caproic, and *lactic* acids; com-

* Naelgeli maintains that the torula and the myco-derma are not distinct species, and, according to Grawitz, the white patches, known as thrush, are due to the presence of the myco-derma, the mycelial filaments and spores of which are distinguished as belonging to the Oidium Albicans. (Zeigler).

bined with ammonia, or other organic alkalies, leucin and tyrosin, sulphuretted hydrogen, carbolic acid, and various other substances. When proteids are entirely decomposed, there remains a substance rich in fats, in earthy and ammoniacal salts, phosphates, and nitrates. (Rutherford).

In hyperæmia of the mucous membrane, there is an excessive secretion of mucus. The chief constituent of mucus is mucin, an albuminoid substance, ready splitting into a number of simpler bodies. Animal substances are taken as food into the mouth. These are principally composed of albuminoids and fats. One of the products of their decomposition is lactose, which breaks up into lactic acid.

We may say, then, that putrefactive fermentation may be set up by the action of bacteria on the mucous secretion, either alone or along with remains of food. When the mucus is extremely viscid, it may determine the location of caries by causing the adhesion of food, &c., to particular surfaces.

In the two processes of fermentation and putrefaction, two acids—acetic and lactic—are formed. These both act powerfully on the teeth.

According to Leber and Rottenstein's experiments, a solution of acetic acid of the strength of 1 in 1000 decalcified in 17 days the enamel and adjacent dentine of a tooth placed in it; a 10 per cent. solution of lactic acid showed, during the same time, a very decided action on another tooth. It is probable, then, that acetic and lactic acids, along with other acids, produced in the putrefactive decomposition of albuminoids, dissolve the lime-salts of the dental tissues.

Miller, of Berlin, states that micro-organisms are never to be found in any but decalcified tissues of the tooth, and this is probable, as bacteria cannot live without water, and it is difficult to believe that they can go on in advance without it.* We may,

* Drs. Leber and Rottenstein, who, in 1877-78, published their researches on origin of caries through the action of *leptothrix buccalis*, differ from Miller.

There is, they say, no manner of doubt that the elementary parts of the fungus penetrate into the interior of the canals, and there develop in a manner to acquire a relatively considerable diameter.

It also results from the very fact of the dilatation of the canals, that the appearance of the fungus is not accidental, and, that it is not by a purely passive action that it invaded the canals. It is necessary that there be a proliferation of spores infinitely

therefore, conclude that they await decalcification. When the dentine is reached, channels are hollowed out to admit the fluid collecting in the cavity behind. In this float the organisms, deriving nourishment partly from it and partly from the disintegration of the organic matrix, by this means producing, and setting free, the acids of putrefactive fermentation to continue the process indefinitely.

The exclusion of water, as a means of stopping the invasion of caries, has long been recognised, and the energies of successive generations of dentists have been devoted to the application of water-tight fillings.

We may conclude, then, that the secretion of the mucous membrane takes part in certain fermentative and putrefactive processes, when in sufficient quantity, either alone or in combination with saliva or foods. That micro-organisms superinduce putrefactive decompositions of albuminoids; that such processes produce acids which act by decalcifying the dental tissues, and so make way for the micro-organisms found by Miller and others. That these organisms, by removing certain constituents of the organic matrix of the dentine, produce putrefaction, and consequent disintegration. That the locality of caries may be determined by the collection of organic matter on dental surfaces, coated with viscous mucous.

The section on pathology has been largely taken from Ziegler's *Pathological Anatomy*. I have also referred to the following works:—Salter — *Dental Pathology and Surgery*. Harris—*Principles and Practice of Dentistry*. Wedl—*The Pathology of the Teeth*. Tomes—*Dental Surgery*. Tomes—*Dental Anatomy*.

The PRESIDENT, after announcing that the discussion upon the paper would be held over till the next meeting, called for any casual communications from the members.

Dr. WILLIAMSON showed models of a case of oral deformity, the patient being a girl of 16 years of age. The external

minute and innumerable of the fungus to effect the dilatation of the tubules. It is, moreover, very important that the elements of the leptothrix should have, at a certain stage, a mobility of their own, in virtue of which they easily penetrate the interior canals. As for the rest, we have met in the canals with only the granular masses of the leptothrix, and never the filaments which appear to show themselves only at the surface. [The granular masses are probably only the disintegrated tissues.—E. A. C.]

appearances were a marked prominence of the lower lips towards the left of the median line; the upper lip was short, and the teeth were readily exposed in smiling, giving a very disagreeable expression to the face. The front lower teeth came well up in front of, and to the left of, the upper, and, at the same time, leant over to the right side, so that the right lower central partly covered the right lower lateral. The upper teeth formed a very much smaller arch than the lower, the outer cusps of the bicuspid and molars being inside the outer cusps of the lowers, and the right lateral was inside the circle of the arch. The case looked so unpromising that all that was done at first was to widen the upper arch with a split plate, in order to gain room to press out the instanding lateral. The patient, however being very desirous to have something further done, it was resolved to bring in the lower teeth and press out the upper ones. Two lower first bicuspid were extracted, and the leaning teeth brought into an upright position, so as to clear the right lateral. That being done a vulcanite frame was made, passing behind the lower front teeth, and having two arms of piano wire embedded in vulcanite, the left one being quite short, and the right one long and resting against the front of the lower front teeth. The ends of the wire were hooked, and were brought together by means of wire twisted up; a similar contrivance to that described in Kingsley's "Oral Deformities," where it was employed to close a partial cleft in the front of the hard palate. Thus the teeth were pressed inward, the frame being, of course, cut away behind. The case occupied about five months, and he thought that the model, taken one year after completion of the case, showed a very fairly satisfactory result.

Another member of the patient's family had a similar tendency, derived from the father, she having a like prominence towards the left, the upper lateral and canine of that side being inside the lower arch. This was corrected, at the age of 22, in a month's time, by means of a plate with a screw opposite each of the two teeth.

The SECRETARY then read the following communication from Mr. John Wells, of Berwick:—As one or two letters have been written on the case of the young man who died at St. George's Hospital from hæmorrhage, perhaps the following may be of interest. A gentleman called on me on 13th October, 1883, to

have a second upper right molar extracted. He had some few years before lost the third on the right side, and to his horror that night he woke up to find the bed clothes covered with blood. He told me two medical practitioners were sent for, and one remained with him for two days before they succeeded in stopping the hæmorrhage. This put me on the *qui vive*. I extracted the tooth, which was a little loose; it did not bleed much at the time, which I thought was a bad sign, and as soon as the bleeding was over replaced the tooth after cutting about the $\frac{1}{8}$ of an inch off the three fangs and dipping it into some carbolic acid and glycerine, one part to three. As he lived some way from here, I asked him to write and let me know if he had any trouble with it in any way. Some three months after I wrote and asked him about it, when he replied saying he had had no trouble with it at all, that the tooth fell out about a week afterwards, and he was glad to say no hæmorrhage had occurred. I have always followed this plan for some years in cases where patients have warned me beforehand, and have never had any difficulty. I cannot say if the above suggestion will be new or not, but it may possibly be of value to some of the profession.

Mr. WILSON remarked that the employment of the extracted tooth, for the purpose mentioned, had been frequently recommended.

Mr. G. W. WATSON exhibited a vulcanite artificial nose, lip, and upper jaw, made by him some years ago for an infirmity patient, to supply those parts, which had been destroyed by Lupus, and whose case was brought before the Society at the time. The patient wore it with great comfort for a year and a half, when the disease recommencing, another operation was rendered necessary, thus making the apparatus of no use. Since then the poor man has been operated on five or six times, and is at present an inmate of the Hospital for Incurables.

He also passed round two microscopic slides, the first exhibiting a pulp that had been destroyed by arsenious acid, and showing well the embolism and aneurismal distention of the blood-vessels, due to the physiological action of the drug upon them. The second was a prepared pulp, taken from the molar tooth of a patient, a lady, who had been suffering from very severe neuralgic pain. When she consulted him he found the pulp exposed, and, taking all things into consideration, he thought

it better to destroy it with arsenious acid. While excavating the cavity, the pulp came away nearly entire, as seen in the slide exhibited, and on examination he found the coronal portion to be composed of pretty large nodules of secondary dentine, with a little soft tissue interspersed, while the root part was also made up of calcification islands in various stages of conversion into hard tissue, the relation of the hard to soft tissues being very well marked.

He attributed the neuralgic pains, so commonly an accompaniment of chronic inflammation of the pulp, to the presence of these nodules in the pulp chamber, and although he knew Mr. Wilson held to the contrary, he had never in his own investigations succeeded in finding them in perfectly sound teeth, but only in those affected by caries, abrasion, or erosion, and he thought that very good evidence in favour of his view. In other words, he looked upon them as a pathological and not a physiological development.

Mr. WILSON said that he did not regard the formation of osteo-dentine nodules in the pulp as being pathological, and did not consider their presence led to pain. In many of the other mammalia it occurred as a matter of course, and in them seemed to be accompanied by an enormous development of cementum, which tissue, in the case of the adult walrus premolars, formed by far the larger part of the tooth.

Mr. AMOORE said he thought the presence of these pulp stones was far more general than was usually supposed. He could not recall his authority, but he remembered hearing of some one who split open a number of teeth that had been selected from the dissecting room as being entirely free from decay, and with very few, if any, exceptions were these nodules absent. He had, like others, noticed them very abundant in the pulps of those teeth that had been the subject of chronic inflammation, and, in one particular instance, the pulp was entirely converted into hard tissue, the tooth, which had been the cause of great pain, being entirely free from caries. At the same time, they were to be found in healthy young teeth, removed for regulating purposes. He could scarcely agree with Mr. Wilson in looking upon their formation as exactly parallel to the normal condition of things to be found in the walrus, for though the processes might be very similar, in the human tooth it was usually carried on so imperfectly,

that the analogy was an unsafe one to prove the point as to whether they were the cause of pain or not.

He was inclined to think, in many instances, that they were the occasion of the trouble, probably by involving some nerve filaments in the same way that a contracting cicatrix was said to give pain, but it would be an exceedingly difficult thing to determine, if, indeed, capable of proof at all.

The PRESIDENT, in closing the meeting, said it was now his pleasant duty, on behalf of himself and fellow office-bearers, to thank the members for their expression of confidence in re-electing them for another term of office. The past year had been a very pleasant one, and productive of good. The papers during the session had been of an interesting as well as a scientific character, while the conversations and casual communications had been of varied nature, and brought the working experiences of members to the assistance of their professional brethren. For next session he was happy to say that they had some definite prospect before them, as he had been promised a paper upon the development of the teeth by one of their most distinguished extra-mural teachers. As a further contribution to the work of next session, he proposed to give his experiences in the use of flowers of sulphur in the treatment of *pyorrhæa alveolaris*. For the past three months or thereby he had been in the habit of prescribing a tooth powder of flowers of sulphur and precipitate of chalk, in equal proportions, and had been thoroughly satisfied with the results. He would not now trouble them with any details, reserving these for next session, when he hoped to substantiate his present success by further experience. In the meantime he would feel deeply obliged by members giving this simple remedy a trial during the recess, and stating the result of their experience when the subject was brought before the Society. He wished them a pleasant time during the recess, and hoped to meet them all in the enjoyment of good health next November.

THE DINNER

of the Odonto-chirurgical Society and L.D.S. was held on March the 12th, at the Balmoral Hotel, Edinburgh. Mr. J. R. Brownlie, of Glasgow, occupied the chair, and Mr. James Mackintosh, of Edinburgh, acted as croupier. After the usual loyal toasts, the CHAIRMAN proposed the Dental Diploma. He said

that the subject presented an *embarras de richesses* to the speaker. To the dental diploma he traced every desirable change that had taken place in the profession since its inauguration, and he did not doubt that a cordial assent would be given by those present to all he might say in its honour. More or less sacrifice had been made to obtain it, and it could not now be gainsaid that the dental diploma has been throughout a complete success. From a small beginning it had developed greatly, and the extent to which it had developed is the highest testimony to the wisdom and forethought of those who gave to the profession the *status* conveyed by the L.D.S. Hitherto it had carried all before it, and if in any sense its work was incomplete, was it not that time was wanted for the accomplishment of all that could fairly be expected from it?

Through the years when its powers were permissive, it may be said to have been serving its time, going through the usual apprenticeship, and entering upon its connection with the profession with all due form, and giving promise even then of the excellent work to be done when its time was out—the time when parliament should recognise its worth and provide it with that place of authority amongst us which later events have shown it to be so competent to fill.

As the first step, and indeed the main proof of the need of those legislative changes which have been effected in our profession, the influence of the dental diploma is quite patent. We can hail with satisfaction all that has been done in this direction, and we can also turn with as much satisfaction to other indications of its power for good. Look at the way in which it has enhanced the value of those services which, as a profession, we exist to render to the public. Invention has no doubt done much, but to a great extent, the manipulative dexterity, the artistic skill, now so liberally cultivated in the schools, may fairly be said here to be the mother of invention.

What is the state of the case in this direction? Why, the dental diploma is simply effecting a revolution. It is sending out young men to begin their life's work as fairly equipped as the most industrious could formerly attain to by such means of study as were open to him, and twenty years of practice added to that. The public, formerly so shy of young, and as then might truly be said, inexperienced men, is daily recognising this fact, and young men have not now to exist somehow, as in days gone by, till the

eye grew dim and the hand unsteady ere they could get credit for fitness to practise our art.

Upon the *personnel* of the profession the influence of the dental diploma is surely beginning to appear. There are those who, coming later, will doubtless see more of this than we do now, but not only are the ranks being recruited from a better class socially, but the education it ensures must have a most beneficial influence in the cultivation of our art as one of the liberal professions. A good dinner predisposes no doubt to look on the brighter side of one's subject, and certainly it is pleasanter to recount its success. There are, no doubt, those who are not altogether pleased with the work of the dental diploma. To such I think it can fairly be said that there is every reason to hope in its future. Its aim is to cultivate the better rather than to repress the worse, and as its work is by no means complete, let us pledge ourselves to aid and loyally assist in its mission.

Dr. SYMINGTON proposed the Odonto-chirurgical and sister societies, and Mr. MACLEOD (president of the Odonto-chirurgical Society) replied.

Dr. WILLIAMSON (Aberdeen), in proposing the Licensing Bodies, urged that the value of the diploma would suffer if the acquisition of it were allowed to become too easy. He thought it high time that a more practical element should be introduced; the profession was essentially a practical one, and success in it greatly depended on manipulative dexterity; such skill should therefore have a due weight in the examination where theory at present was alone required.

Dr. P. H. McLAREN replied.

Mr. AMOORE, in proposing the visitors from a distance, alluded to the gratification with which the Edinburgh members welcomed the ample contingent of friends from the west.

The evening was very successful, and the musical programme was admirably sustained by Messrs. Rees Price, Mackintosh, Biggs, Durward and Dr. Williamson.

THE ODONTOLOGICAL SOCIETY.

ORDINARY Meeting, held on April 5th, the President, Mr. CHARTERS WHITE, in the chair. The evening was entirely devoted to "Casual Communications."

The PRESIDENT related a case which he thought might be of

interest, and of which he had not previously had experience. A lady that morning came to him in the following circumstances. She had for the last five or six years been wearing a vulcanite lower plate, attached by wire bands to the two lower canines, which had subsequently come out, and the bands, not meeting the lateral incisor by one-sixteenth of an inch, or a little more, had been left in, and had worked into the lower lip. Her only means of keeping the lower plate in its place was by the lower lip, and this had caused two swellings to arise in the vacant place and the lower lip. Hypertrophy set in, and the patient could not get the plate out without hurting herself. He had to get her to permit him to cut the band to get it out of her mouth, and the plate was coated with a very large quantity of tartar, both on the inside and also on the outside. He might have cut through the membrane, but to this his patient had a very great objection.

Dr. WALKER showed several specimens and models of continuous gum work. He said this work had been known as long as the oldest member could recollect, and had been treated of in "Harris's Mechanical Dentistry." It was late in the day for him to express his thanks to Mr. Verrier for his furnace, but it had proved of the greatest value, and its introduction had enabled him to accomplish things he could not do without it. He found he could produce a fair sample both of complete and partial denture of continuous gum by its aid. He had experimented both with continuous gum body and continuous gum enamel, with the result of proving the possibility of preparing a full denture by means of the gas furnace, the possibility of adding to or repairing continuous gum dentures, and the possibility of preparing continuous gum dentures that should be a perfect fit in the mouth. This last was an important point, as old practitioners had told him that where they failed was in the fit. He thought it would be admitted that the specimens which he exhibited were a very fair fit. Another important point was the possibility of having a facepiece of continuous gum mounted without any cracking or displacement of teeth. He accomplished this by having three or four teeth mounted on a plate, then soldered with a full-sized Fletcher's blowpipe, then the teeth are soldered to a platinum bar by means of the blowpipe. If it is wished to use pure gold, the bar and platinum pins must be united with the blowpipe. An even surface ready for the enamel must then be obtained. A point he had to

pay special attention to was how to vulcanise partial gumpieces. This was done by adopting Balkwill's principle of vulcanizing without pressure. The pieces are mounted with pure gold by a blowpipe and fired once; if it is desired to obtain a deeper colour, it should be painted twice and fired twice. Simply the quantity placed upon the body, together with the difference in temperature of firing, will produce the difference of colour.

His second tray of models contained specimens of continuous gum facings for six or eight teeth, mounted on platinum half-round bars, for shallow bites. The middle row were specimens of three mountings, with different colour enamel, ready for mounting in their vulcanite denture. Also on the same tray were cases prepared with the same firing, but different gum body and enamel. If it was desired to fire with American gum body, American teeth must be used; and if Ash's teeth were used, their body and enamel might also be employed. He mentioned that Messrs. Ash had been giving their attention to the subject, and were now able to supply gum body and enamel of their own preparation.

The third tray contained specimens of full continuous gum dentures. The model is prepared so as to be on edge; the case is invested, but instead of its being platinum bar, platinum lining is used, and the lining passes between the teeth before and behind, thus equalizing the expansion of the plate; the platinum lining is not perforated, but the pins simply bend on it. Serrations are necessary in full-sized dentures.

On the same tray was a specimen of failure, owing to its being overfused and badly fused.

An important point to be mentioned in the use of the Verrier's furnace was the discarding of the table inside the muffle. This, in practice, had been found a mistake. He now simply used silex, and surrounded the denture everywhere with it, so as to have an equal support and assistance, and pass it into the muffle. Then the gas burner will produce heat enough to fuse the gum round the alveolar surface, but not sufficient to make the palate comfortable. The case must be allowed to cool, and then put in the muffle a second time.

With reference to the gum body and gum enamel, all the component quantities and the nature of preparation would be found in "Harris's Mechanical Dentistry."

Dr. Walker concluded by saying that he thought continuous gum work the work of the future.

The PRESIDENT characterised the communication as one of the most valuable that had been made for a long time, and they were greatly indebted to Dr. Walker for the care and trouble he had given to the matter. All who saw the specimens of continuous gum work could not but admire them. One thought had occurred to him while listening to Dr. Walker, who would, perhaps, answer his question. Supposing a patient was difficult to please, and wanted the case altered, could alterations be made?

Mr. WALTER COFFIN expressed his obligation to Dr. Walker for having demonstrated to them the possibility of firing one entire piece. He had had some experience in partial sets, but he had not hitherto been successful with full sets.

DR. CUNNINGHAM referred to the case of failure which he had related at a previous meeting, and detailed the many difficulties he had to encounter—difficulties in the “checking,” and in the colour of the gum. This latter, he found, was owing to the material. He agreed with Dr. Walker as to the impossibility of making the gum body for themselves; they must be content to use the materials put into their hands. He had communicated with Dr. Ambler Tees, of America, suggesting that possibly there was some difference in gum body sold at one time and at another, and the reply he had received justified that opinion. With regard to checking, which Dr. Walker thought was entirely due to a deficient or irregular gas supply, he would say that he had a very large gas supply, and there was no doubt that that was not the cause. He had written to S. S. White, of Philadelphia, who had replied: “The cause of checking is not easy to determine. Dr. Allen himself uses the gum body and enamel of our own manufacture; meanwhile we can supply either Dr. Ambler Tees’ or Dr. Close’s gum enamel.”

DR. WALKER, replying, said, with regard to alterations he had shown them what could be done. It was possible to add to without pulling to pieces in Verrier’s process. In the combined work of vulcanite and continuous gum it was necessary to disconnect them before attempting alterations. He omitted to say previously that no screw pressure or vice pressure should be used. After packing, Balkwill simply coats the model with chloroformed rubber, presses the plate with finger and thumb, and packs with his two hands sufficient rubber to carry the thickness of the

denture. This was the process which enabled him to make combined work of continuous gum without cracking or displacement. The temperature for fusing is 2200. With reference to the question whether the age of the gum body and enamel affected the result, he said that he found that if he kept Allen's gum body twelve months it gave a very different result to fresh material.

Mr. WALTER COFFIN exhibited two models, illustrating a regulation case which had been very skilfully treated by his brother, Mr. Harold Coffin. The case was an ordinary one, deriving its interest from the age of the patient, who was an undergraduate, and had greatly aided the successful treatment by the intelligent observance of instructions and advice. He was twenty-four or twenty-five years old when he consulted them on account of the very great malformation of the face externally. There was a falling in on one side, on which side the canine protruded. Extraction would only have increased the deformity.

The PRESIDENT said it was a very interesting case of successful treatment. He should have been inclined to take out the canine.

Dr. W. St. GEORGE ELLIOTT showed a small oil lamp for heating water for use with the syringe, which he found superior to gas, as it gave a much more even temperature, the range being only six degrees. He also showed some crystal gold (which he always used in preference to any other) which had been cut with a rotary knife made to run in the dental engine. He exhibited also a small oil can for oiling instruments, &c., very like a hypodermic bulb syringe.

Dr. GEORGE CUNNINGHAM reported a case of tetanus which he thought somewhat exceptional. He described the case in detail, apologising for introducing what might appear trivial particulars, but he thought it necessary in order to help them to determine the cause. It was a case of general tetanus, and the question arose whether it was due to dental lesion or was it idiopathic. The facts were as follows. The patient was a healthy muscular young Cambridge undergraduate, aged about 19½. Some time ago in eating some American tinned meat he crushed a piece of bone in the upper left molar, causing great pain, which however passed off. He returned home, and when playing football about the 10th January last he was rather hurt. On the 20th January he was returning home late at night in a cab. On the 21st he felt some pain in the left molar, and went to the family dentist, who filled the cavity

with amalgam. On returning to Cambridge he felt a stiffness in the lower jaw, and he then consulted a surgeon there. There was pain on the left side of the face and contraction of the masticatory muscles; it seemed to be a case of trismus. The symptoms at that time were not sufficient to advise any treatment. After going to the surgeon again he was much worse, and was instructed to go and consult him (Dr. Cunningham). He found the teeth apparently strong and healthy and very free from decay, but much crowded. The electric lamp enabled him to come to the conclusion that the cause of the trouble was not the wisdom tooth. The molar was very sensitive to percussion. It was determined to remove the filling, and a carbolized dressing was applied, when the patient immediately felt relief. There were quite marked facial spasms. On 3rd February he found the upper molar was comfortable, but the facial spasms were worse. He advised gas and extraction of the pulp, but the surgeon thought extraction of the tooth would be safer. About the sixth day after the attack the patient was much worse, the facial spasms were very strongly marked, there being also the peculiar gape which is one of the signs of tetanus. The extraction of the tooth was successfully carried out under chloroform, and he removed the corresponding lower tooth also, according to his usual practice. The disorder was not relieved by the operation, the disease ran its course in about three weeks, cramps and tetanus beginning in the jaw, then passing to the body and legs, the same as in *rigor mortis*. Extraction of the tooth was resorted to to remove the possible source of the trouble. The patient was dieted upon beef tea, milk, &c. He thought tetanus must be looked upon as an exhausting malady which runs its own course, and if the patient can be kept alive there is hope of recovery.

The PRESIDENT, remarking that there was no need of apology from Dr. Cunningham for bringing forward the case, which might arise with anyone, said he was strongly inclined to think that it was idiopathic and had nothing whatever to do with the teeth.

Mr. STORER BENNETT would like to ask Dr. Cunningham if he broke open the tooth after it was extracted, so as to endeavour to ascertain the cause of the trouble.

Mr. C. J. BOYD WALLIS said he had had a case which was similar, and in which extraction gave relief; it was one which was a good illustration of the mischief, suffering and anxiety that may

arise from diseased and neglected teeth. A medical friend sent a lady, aged about 32, to him for advice concerning her teeth. She was tall, thin, of delicate health, with pale complexion; she had been suffering severely for some time from neuralgia, with occasional pain in one or other of her molar teeth, all of which (of those remaining) were more or less decayed. In addition to the neuralgia, there was a sentient paralysis of the right side of the face, affecting the eyelid, nose, and facial muscles. The nose was drawn to the right, the muscles of the face were contracted, and there was loss of power in the eyelid, and what the patient described as a "dead feeling" down outer side of the right arm. Tonics, with strychnine, &c., and change of air had been tried, but with little or no effect. When the patient came into his hands, upon examination he at once advised the removal of the upper right second molar (abscess) and wisdom root, and left second bicuspid, upper left molar roots, lower left wisdom. Gas and ether were administered the first time, but, failing to remove the lower left wisdom, gas alone was administered the second time, and the teeth named were removed. All these teeth were broken down with decay; but pain had not been confined to any one tooth for more than a few minutes at a time, though pain about the head and neck had been more or less constant for some six weeks. His patient writes him that she is now quite free from pain, and that her face has regained its normal condition, while her general health is much improved.

Mr. E. G. BETTS said, considering how very uncertain all pathologists are of the cause of tetanus, it might be a matter of surprise how very few cases were met with in dental practice. They so very often had laceration of the nerves, and it seemed to be a laceration of the nerve which gave rise to it. He thought it might be considered as highly probable that Dr. Cunningham's case was caused by laceration of the nerve from biting the piece of bone up into the tooth.

Dr. CUNNINGHAM, in reply, said he did not think the fact of there being no immediate relief was any proof of the disease being due to dental lesion, because when once general tetanus had set in, as far as pathology can suggest, it seemed that the nervous irritation being started progresses down the spinal cord and affects the whole body. He was quite sure that the biting of the bone did not lead to any direct laceration of the pulp. He was

also quite sure that there was no exposure of the pulp of any decided character. This was in favour of the dentist who put in the amalgam stopping. The exposure was of the most minute kind, and he had to explore very carefully to discover it. He did split open the tooth, but he frankly confessed to knowing so little about the true pathology of the pulp that he could give no reliable information about it.

Mr. W. A. MAGGS read notes of two cases of Epulis treated by ligature. He had a vivid recollection of the formidable operation, and excessive hæmorrhage, that usually attended the removal of such growths at the hospitals, and it appeared to him that if such heroic means were necessary, it should only be in cases where the ligature had failed. In each of these cases nearly two years had elapsed, and there had been no recurrence.

The PRESIDENT said he was disposed to agree with Mr. Maggs in protesting against the adoption of heroic treatment in all cases of epulis. No doubt the use of the bone forceps, actual cautery, &c., was sometimes necessary, but cases did often occur in which, as Mr. Maggs had pointed out, simpler measures would suffice.

Mr. BETTS remarked that Mr. Maggs was fortunate in meeting with pedunculated tumours; they were more often sessile, and then the ligature was not applicable. In such cases he had found the application of ethylate of sodium very satisfactory; it destroyed the growth and caused no pain. In one case the application was followed by some hæmorrhage, which was arrested by styptics, but three applications of the ethylate completely removed the tumour, and there had been no recurrence.

Mr. HEPBURN thought that the growths spoken of by Mr. Maggs were rather of the nature of polypi than of epulis. The former might safely be excised, and if the source of irritation was removed there was little chance of recurrence. But in the case of epuloid growths, it was necessary not only to remove the root or tooth which appeared to have given rise to it, but also thoroughly to clear out the socket whence it came.

Dr. WALKER mentioned the case of a lady who suffered during four successive pregnancies from a vascular granulating growth of an epuloid character; there was frequent and very troublesome hæmorrhage. Dr. Walker managed to keep the growth in check by means of chloride of zinc. In the intervals between the pregnancies it was quite quiescent and caused no inconvenience.

Dr. CUNNINGHAM thought that Mr. Maggs applied the word epulis to something very different from what was usually understood by the term. As regards epulis proper, he was of opinion that mild treatment was not only useless, but seemed generally to aggravate the disease. As an instance of this, he referred to a case in which his late partner excised an epulis, and it recurred within a year in a worse form.

Mr. STORER BENNETT said it was a fact well established by experience that mild operations were of no use in cases of true epulis; it was necessary not only to remove the growth, but also the portion of periosteum whence it sprang. What Mr. Maggs had spoken of as "epulis" were evidently cases of simply hypertrophy of the gums, which were easily treated. It was specially important to guard against all chances of recurrence in a case of epulis occurring in a person of middle age, such as Mr. Maggs' second patient, since if a recurrence did take place under these circumstances it was very likely to be of a more malignant character than the original growth.

Dr. ST. GEORGE ELLIOTT remarked that most of the previous speakers had admitted that some fibrous tumours of the gum might be successfully got rid of by comparatively simple treatment, though they asserted that others required what was, to the patient at least, a decidedly formidable operation. But who was to decide what the operation was to be? He would instance the case of a young lady who consulted a well-known London hospital surgeon with reference to an epulis over the left upper lateral. He told her that it must be excised. The patient then applied to him (Dr. Elliott); he painted it two or three times with ethylate of sodium, and at the end of a month the tumour had completely disappeared and did not return.

Mr. BOYD WALLIS referred to two cases of epulis treated by electrolysis which he had brought before the Society about two years ago, models of which would be found in the museum. No recurrence had taken place.

Mr. WALTER COFFIN said he had met with one case of epulis which had been successfully treated by electrolysis. He had heard it stated—he did not know whether it was true—that treatment by electrolysis, even if not successful in removing the tumour, did not aggravate it, as incomplete surgical operations not unfrequently did, and this, if true, was certainly an advantage.

Mr. MAGGS, in reply, said that doubts had been expressed as to whether the cases he had described were cases of epulis. The term was not capable of very strict definition, but he was equally in doubt as to whether the cases mentioned by Messrs. Walker and Betts were cases of epulis; he should have said they were rather of the nature of vascular growths. He wished to point out that in each of the cases he had reported he had removed the teeth which appeared to have given rise to the growths. This would be followed in due course by the absorption of the alveoli, and therefore it appeared to him unnecessary to interfere surgically with parts which would, if left alone, be removed by a natural process; and he still thought that, at all events where the growth sprang from a limited base, the treatment he had adopted was sufficient.

The Society then adjourned.

PRESENTATION TO MR. DAVID HEPBURN, EDINBURGH.

ON Friday evening, the 16th ultimo, a deputation of gentlemen, consisting of Messrs. W. Bowman Macleod, Robert Reid, Andrew Wilson, Matthew Finlayson, Alexander Cormack and J. S. Amoores, as representing the subscribers, waited upon Mr. David Hepburn, L.D.S.Eng., and presented him with the following address and an agreement of annuity entered into with the Caledonian Insurance Company for the sum of £30 per annum.

Mr. BOWMAN MACLEOD, President of the Odonto-Chirurgical Society, in making the presentation, desired Mr. Hepburn's acceptance of the bond of annuity as a tangible though small token of the esteem and respect of friends and professional brethren, who appreciated his services in the cause of professional progression, and who sympathised most deeply with him in the dispensation of Providence which had closed his professional career while yet he was full of vigour. They hoped that, though forced to retire from the more active duties of life, he would yet be spared in the enjoyment of good bodily and mental health for many a year to come, and trusted that the possession of the bond would carry with it the annuitant's proverbial immortality.

To his family, the address might now, and when he was gone, be an ever-present remembrance that their father was a man

beloved by his friends and honoured and respected by his fellow-professionals.

Mr. HEPBURN confessed himself overcome by this expression of his friends' regards, which he honestly felt he had done so little to merit, and could now do less to justify. He could not, however, refuse to accept, and that most gratefully, such a spontaneous and handsome expression of the estimation in which his services to the profession were held—a profession in which he had laboured for fifty years—and would cherish the memory of this night as one of the brightest spots in his existence. Though debarred by loss of sight from continuing the practice of his profession, he was thankful to say that he was still in full sympathy with it, and with the world at large, and still capable of thoroughly enjoying the pleasant association of a large circle of staunch friends, amongst whom he was proud to number so many professional brethren.

The deputation then wished Mr. Hepburn many long and happy days in the bosom of his family. Letters of apology and good wishes were received from Dr. Smith, Mr. Campbell (Dundee), Mr. MacGregor, Mr. McCash, Mr. Tomes, senr., Mr. J. Smith-Turner, Mr. Underwood, Mr. Gregson, &c., &c.

A beautifully-illuminated address, engrossed on vellum, read as follows:—

Presented to Mr. David Hepburn.

16th APRIL, 1886,

Along with Bond of Annuity to the annual value of Thirty Pounds Sterling.

The accompanying Testimonial is presented to Mr. DAVID HEPBURN, along with this Address, by a number of his friends and professional brethren, as a mark of their esteem for him, and an acknowledgment of their appreciation of his efforts in promoting an increased social amity among the members of the Dental Profession, more especially in advancing the development of the Odonto-Chirurgical Society of Edinburgh, as well as in other labours of a similar kind.

And in making such presentation they would also desire to record their profound sympathy in the affliction sustained by him in the loss of his eye-sight; while they would pray that he may be long spared to enjoy the companionship of his friends, and the contemplation of a life devoted to the elevation of his profession and the good of his fellow-men.

Signed on behalf of the Committee and Subscribers,

Dr. Smith, Edinburgh.
Dr. Reid, Edinburgh.
Mr. Macgregor, Edinburgh.

Mr. A. Wilson, Edinburgh.
Mr. Biggs, Glasgow.
Mr. Campbell, Hon. Sec., Dundee.

W. BOWMAN MACLEOD,
President O.C.S.

Subscribers.

Mr. J. S. Amore, Edinburgh.	Mr. Robert Hepburn, London.	Mr. R. Peel Ritchie, Edinburgh.
Professor Annandale, Edinburgh.	Mr. Alfred Hill, London.	Mr. T. A. Rogers, London.
Messrs. Ash & Sons, London.	Dr. Hogue, Edinburgh.	Sir Edwin Saunders, London.
Mr. W. J. A. Baker, Dublin.	Mr. S. J. Hutchinson, London.	Dr. Smith, Edinburgh.
Mr. John A. Biggs, Glasgow.	Mr. Imlach, Edinburgh.	Mr. John Stewart, Perth.
Mr. J. R. Brownlie, Glasgow.	Mr. J. M. Lipscomb, Kilmarnock.	Mr. Sutherland, Glasgow.
Mr. D. R. Cameron, Glasgow.	Mr. James Macintosh, Edinburgh.	Mr. George Syme, Dundee.
Mr. T. R. Cameron, Paisley.	Mr. W. B. Macleod, Edinburgh.	Mr. E. M. Todd, Brighton.
Mr. Walter Campbell, Dundee.	Mrs. Matheson, Edinburgh.	Mr. John Tomes, England.
Mr. W. F. Canton, London.	Mr. Chas. Mathew, Edinburgh.	Mr. W. J. Smith-Turner, London.
Mr. James Cooper, Edinburgh.	Mr. J. M. McCash, Glasgow.	Dr. Joseph Walker, London.
Mr. A. Cormack, Edinburgh.	Misses McCulloch, Edinburgh.	Mr. P. Walker, Dundee.
Mr. D. Cormack, London.	Mr. McCulloch, Edinburgh.	Mr. James Wallace, Glasgow.
Mr. E. F. Cox, Jersey.	Mr. Malcolm McGregor, Edinburgh.	Mr. C. J. B. Wallis, London.
Mr. P. Crombie, Aberdeen.	Mr. John Milne, London.	Mr. G. B. Watson, Edinburgh.
Mr. J. T. Cunningham, Edinburgh.	Miss Nisbet, Edinburgh.	Mr. Richard White, Norwich.
Mr. Durward, Edinburgh.	Mr. John O'Duffy, Dublin.	Mr. Thos. C. White, London.
Mr. W. Finlay, Edinburgh.	Dr. Orphoot, Edinburgh.	Dr. Williamson, Aberdeen.
Mr. M. Finlayson, Edinburgh.	Mr. L. J. Platt, Stirling.	Mr. Wm. Williamson, Aberdeen.
A Friend, Edinburgh.	Mr. Rees Price, Glasgow.	Mr. A. Wilson, Edinburgh.
A Friend, Edinburgh.	Mr. John Raeburn, Edinburgh.	Dr. Wood, Dumfries.
A Friend, Mr. Thos. Underwood, London.	Mr. Wm. Raeburn, Edinburgh.	Mr. W. S. Woodburn, Glasgow.
Mr. Gregson, London.	Dr. Reid, Edinburgh.	Mr. J. R. Young, Edinburgh.

CORRESPONDENCE.*To the Editor of the DENTAL RECORD.*

SIR,—Having read the article upon Cocaine in the last number of the RECORD, I immediately commenced using it, hoping that we had at length found that great desideratum to dentists—a perfectly safe and reliable local anæsthetic.

I carefully followed the directions given, using 1 grain of hydrochlorate of cocaine dissolved in 10 minims of distilled water, and injecting into the labial and lingual surfaces of the tooth to be removed. In two or three cases the results were very satisfactory, the patients assuring me that they had not felt the slightest pain; in other cases pain was felt, but greatly modified; but in two cases the results were both unexpected and alarming. In the one case a young man of delicate appearance was seized with nausea and trembling, followed by great depression, and for a few minutes loss of all muscular power, the patient declaring that he had never felt so ill in all his life. In the other case, a strong healthy-looking woman became comatose, remaining so for about half-an-hour, and requiring strong restoratives to rouse her. In both these cases the general effects were out of all proportion to the local, the patients declaring that the extractions were very painful. I may mention that both the successful and unsuccessful cases were from the same lot of cocaine, so were not caused by any difference in the drug.

A friend also informs me that, after injecting cocaine in the same way and of the same strength, the patient, a healthy-looking woman, became quite comatose, remaining so for three hours, and defying all efforts to rouse her, and he is now afraid to use it.

Now, sir, can you or any of your readers explain to me the reason why this drug acts so differently upon different people, and how to diagnose those cases unfitted for its use? I am now trying a 5 per cent. solution, and have hitherto had no unpleasant after-effects, but the anæsthesia is far from perfect, and I should prefer using the 10 per cent. if I could feel sure of no ill effects.—I am, sir, yours obediently,

ARTHUR P. PENROSE.

5, Amwell Street, E.C.

OBITUARY.

WE regret to announce the very sudden death of Arthur Baxter Visick, L.D.S.I., D.D.S., which took place on the 12th ult., at Horsham, in Sussex. Dr. Visick succeeded to the practice of the late Mr. Sercomb, of Brook Street, Hanover Square. Having, in conjunction with his partner, Dr. W. Finley Thompson, sold that practice, he was for the past two or three years practising at Horsham and at Guildford.

Editorial.

AN INSULT TO BRITISH DENTISTRY.

“WILL not that be a thing worthy of ‘doing;’ to deliver ourselves from quacks, sham-heroes; to deliver the whole world more and more from such? They are the one bane of the world. Once clear the world of them, it ceases to be a Devil’s-world.” These words of Carlyle express the motive which has actuated *The Medical Press* (April 21st), in a vigorous article upon a certain pamphlet—“A few Remarks on American Dentistry in England.” The names of the authors of this advertising medium are not to be found in the *Dentists’ Register*, yet they write:—

“The ordinary English dentists are men who have had no hospital education, in fact no opportunity of seeing thoroughly good operative or artistic dentistry, whose time has been spent in making artificial teeth in perfect rows in the laboratory or work-room of some other dentist, and having saved a little money they start in practice themselves.

“In the two Dental Hospitals in London, which are the best schools for English dentists, thousands of teeth each year are extracted that should and can be saved, which is not only a disgrace to the dentistry of England, but it teaches the young dentist to put no value on their patients’ teeth.

“Those who do value their teeth and wish to save them are cautioned to avoid the ordinary English dentists, and to assist in protesting against either having teeth extracted themselves or permitting others to have them extracted.”

The foregoing paragraphs are downright insults to English dentists, to teachers of dentistry in England, and to the intelligence of the English people. There is reason to believe that they who are responsible for these gross libels are not Americans. Certainly no one with the least regard for a possible reputation, or for other than purely personal motives, would utter such statements. The article of the *Medical Press* will receive the general approval of the dental profession ; but, alas ! the unwary public will require many such remedial measures ere it will sing, "Quacks shall no more have dominion over us, but true Heroes and Healers !"

GOSSIP.

MR. E. A. BEVERS, M.R.C.S., L.S.A., has been appointed Dental Surgeon to the Radcliffe Infirmary, Oxford.

IN the course of the recent Bartlett trial, Mr. T. Roberts, dental surgeon, was giving evidence as to the late Mr. Bartlett's teeth, when the Judge asked him—"Did you use any solution on his gums?" "A solution of cocaine, which is a drug lately used to promote local anæsthesia." "Is it a vegetable or a mineral drug?" "I don't know." The Judge—"It is the active principle of the cocoanut, is it not?" "I really cannot say." (The DENTAL RECORD had not been read.—ED.)

MONTHLY STATEMENT of operations performed at the two Dental Hospitals in London and the Dental Hospital, Birmingham, from March 1st to March 31st, 1886:—

	National.	London.	Birmingham.
Number of Patients attended...	1,670	2,690	932
Extractions { Children under 14	464	350	661
Adults	693	961	
Under Nitrous Oxide	486	603	
Gold Stoppings	80	381	6
Other Stoppings	680	949	59
Advice and Scaling	342	120	113
Irregularities of the Teeth	202	182	—
Miscellaneous	148	358	97
Total	3,095	3,904	936

THE DENTAL RECORD.

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JUNE 1, 1886.

No. 6.

CUCAINE IN DENTAL SURGERY.

By C. J. BOYD WALLIS, L.D.S., R.C.S.Eng., &c.

THE importance of cucaine and its salts as a therapeutic agent is growing apace, and probably when a better and larger supply of the cuca leaf enables chemists to produce this alkaloid and its salts of a more uniform quality and at a lower price, we shall find them the most important and useful adjuncts to our Dental Materia Medica that have been made since the introduction of nitrous oxide gas and carbolic acid into dental practice ; and when we have gained further experience of their action on the human system when used internally, and by subcutaneous injection, we shall find that the hydrochlorate of cucaine will run nitrous oxide gas rather closely as an anæsthetic in certain dental operations, although it will not altogether supersede it.

Recent experiences, as related in the professional journals, of several members of our profession, appear so conclusive as to the value of cucaine by injection for the extraction of teeth, that I should not have thought it worth while to draw further attention to the subject, but that I have found it very difficult in many cases to get a correct and unbiassed opinion from our patients upon the effects and special value of the remedies and methods we may severally adopt in our treatment of the teeth. I have, therefore, thought the experience of a dental surgeon, who has submitted a test case in his own person, to treatment by subcutaneous injection of cucaine, worthy of recording.

My own teeth, in years gone by, received less attention than they might otherwise have done had they belonged to one of my patients ; consequently my lower left canine tooth, an unusually large one of its kind, has been a source of trouble to me periodically for some few years past, and during that time I have employed

it as an experimental tooth, treating it in various ways, temporarily filling it and neglecting it alternately, until about six weeks since, when I took severe cold, which resulted in acute pain in the tooth, followed by alveolar abscess and swelling of the chin. I then determined to have the tooth removed, and with this view I consulted my friend Mr. Gaddes. As the tooth was badly decayed, a very large one, and firmly imbedded in its socket, I was inclined to submit to the administration of gas; but Mr. Gaddes persuaded me to try cocaine, and being anxious to test it by injection for this purpose in my own person, I consented.

Ten minims in all of a ten per cent. solution of cocaine were injected beneath the gum, without pain, anteriorly and posteriorly to the tooth, and four minutes were allowed to pass, when Mr. Gaddes skilfully removed the tooth—not altogether without pain; nevertheless the pain was so slight as to cause me to think very favourably of cocaine as a medium for the purpose advocated, for I am of opinion that had six or seven minutes instead of four been allowed to pass before operating, it would have been entirely painless, for I found that anæsthesia was more complete a minute or so after the operation, and it was also complete in the lower lip. A little later a feeling of numbness existed at the extremities, whilst my feelings generally were agreeable and of perfect content—with a desire to remain quiet and be “let alone.” Anæsthesia nominally passed away in half-an-hour, and completely in three-quarters of an hour. Not the least satisfactory part of the case was the entire absence of pain after extraction, and the slight amount of hæmorrhage—two results I did not anticipate, when considering the size of the tooth and the amount of surrounding inflammation. Shortly after the operation a swelling, the size of a marble, almost suddenly appeared over the site of the first molar tooth which had been extracted some few years previously from a similar cause. This swelling became very hard and gradually disappeared in about four days.

Of the several cases I have had in practice in which I have used cocaine, the following may be of interest both on account of the highly nervous temperament of the patient, and of the quantity of cocaine used. A lady to whom gas was administered with very unsatisfactory results some twelve months previous consulted me concerning the removal of two upper canine roots (the only

roots remaining), preparatory to making her a new denture. My patient, who was of a highly nervous organization, though of a very plucky disposition, said that she would never take gas again, and her medical attendant had advised her against chloroform for this purpose. She seemed to dread the operation so much that, although very determined to get rid of her troublesome teeth, she was evidently labouring under great nervous excitement. I therefore suggested the injection of cocaine, and having explained its effect to her, she readily consented. Previously administering to her two drachms of *Extractum Cocæ Liquidum B.P.*, in half a wine-glass of water, I allowed her to wait about half-an-hour, whilst I busied myself in other ways and diverted her attention. I then injected 20 minims of a 10 per cent. solution of hydrochlorate of cocaine (10 minims to each tooth), and removed the roots, apparently without any pain to my patient, who afterwards expressed herself as greatly pleased with the result. I look upon this case as another highly satisfactory test, and from the fact of my employing *two* grains of the salt upon a highly nervous patient, I was particularly anxious as to the result, but was afterwards as well pleased as my patient, who became so interested in the "wonderful cocaine" that I had some difficulty in answering her many questions upon its character and uses.

Yet another case, which speaks perhaps more satisfactorily as to the value of cocaine in extraction than either of the foregoing. A patient asked me if I would mind looking at the mouth of his dog, which was evidently suffering from its teeth. On examination I found the lower left canine, a sound tooth, simply biting right into the upper lip, which was swollen and very tender to touch. Thinking this a good opportunity to test cocaine, I suggested, and explained, the removal of the offending tooth under the drug. To be brief, a solution of one grain and a-half of the hydrochlorate in 15 minims of water was injected, and six minutes allowed for it to act; the tooth was then extracted without a "growl" or other indication of pain from the dog, but the animal put on a curious and very silly look, and seemed greatly puzzled at the anæsthetic condition of the mouth, which it brushed several times with its paw, and looked up in a quiet enquiring manner, as though asking the question, What have you been doing to me? Thus from these experiences I feel justified in saying that we have found in cocaine another very valuable

antidote to the "terrors" of the operation chair. It only remains for us to elucidate the problem of its physiological effects upon the human body of various ages and peculiarities of temperament and health.

Amongst other uses of cucaine from which we may anticipate valuable results, is in its application to the tongue, soft palate, and fauces, in cases where these organs are in such a highly sensitive condition as to almost preclude the possibility of obtaining a correct impression of the mouth for the adaptation of artificial dentures. One case will suffice to show the value of cucaine in such instances. A German lady was recommended to consult me in her trouble. She informed me that she had consulted a dentist in Geneva who had tried to take an impression of her mouth, but was prevented by her violent retching; another appointment was made, which was not kept; the patient next consulted a Paris practitioner, who succeeded in obtaining an imperfect impression, to which a gold upper denture was made, and which she had never been able to wear. The patient next came into my hands, and after some difficulty I succeeded in obtaining a very imperfect impression, and was thinking of giving up further attempts for that day, when the idea of spraying a solution of cucaine into the mouth occurred to me; after explaining the nature of the chemical, I decided to try it. Having allowed my patient to recover from the previous attempts, I requested her to rinse the mouth well with water to which a little spirit of wine was added; I then sprayed the back of the tongue and palate with a two per cent. solution of hydrochlorate of cucaine, which I gave six minutes to take effect, and then took an impression without any difficulty or apparent distress to the patient. The same means were adopted when the "bite" was taken, and again when the denture was placed in the mouth. I requested the patient not to remove the plate for a few days, and she is now wearing it satisfactorily, and has expressed herself much pleased with the result. Cracked or sore lips are a frequent source of annoyance to the patient during operations in the mouth; cucaine may with great advantage be applied in such cases. M. Bignon, Professor in the Lima (Peru) School of Pharmacy, recommends for internal use and sprays five per cent. alcoholic solutions of the *alkaloid*. For general external use (burns, catheterisms, and for eye maladies), he prefers cocainated petrolatum. The anæsthetic properties of the alkaloid are

attenuated in the salts; the best therapeutic results are always those that are obtained with the pure alkaloid, but the latter takes longer to act.

In a previous article (April, 1885), I advocated a solution of cucaine in *eugenol* as an application for sensitive dentine, &c., and I am still of opinion that cucaine in *eugenol*, with a little boracic or benzoic acid, is the best combination for external use on the teeth and gums.

Eugenol acts as an excellent solvent for cucaine, and being sedative, antiseptic, and preservative, I prefer it to all other combinations as an ordinary pain obtunder, and for this purpose a sample of this preparation remained effective for nearly two years. The following is a useful combination and keeps well:—

℞ Cucaine (or the Hydrochlorate)	...	...	...	...	grs. xx.
Morphia Hydrochlorate	...	...	...	...	grs. v.
Benzoic Acid	...	...	...	...	grs. vj.
Eugenol	...	...	...	...	3j.
Alcohol Absolute	...	...	...	...	3j. Mix.

Salicylic acid has been employed as a preventative to the development of organisms in solutions of cucaine, but it is objectionable on account of its irritant effects, and camphor is unsuitable for similar reasons. Boracic acid appears to be more advantageous and in the proportion of 0.5—1 per cent. it will preserve a solution of the hydrochlorate for such time as it requires to be kept in ordinary practice and for ordinary purposes.

Cucaine and phosphates, cucaine and morphia, and cucaine and atropine sulphate, assimilate well together, adding to each other's power. The following is a very useful dentifrice which gives satisfactory results when applied to sensitive or painful teeth, or to tender and spongy gums:—

℞ Calc. Phosph. Præcip.	...	...	...	...	3ij.
Cretæ Præcip.	...	...	...	...	3j.
Pulv. Sacchar. Lact.	...	...	...	...	3j.
Cucainæ Hydrochlor.	...	...	...	...	grs. ii.
Eugenol	...	...	...	...	℥. xvi.

Dissolve the cucaine in a little alcohol, mix it with the eugenol, and add this solution to the desiccated calcium phosphate previously warmed, mix well, and add the other ingredients, stirring the whole in a mortar until the powder is homogeneous.

Benzoate of Cucaine—a new preparation suggested by Dr. Alfredo

Bignon in a paper published in "La Cronica Medica," and stated by him to be a more stable salt than the hydrochlorate, and preferable because of the duration of the anæsthesia produced and for its non-irritating properties, its application being quite painless. In a case of epithelioma of the tongue anæsthesia from the benzoates lasted four hours, whereas that produced by the hydrochlorate lasted one hour. In my hands the benzoate of cucaine, obtained from Paris, did not prove at all satisfactory—indeed its anæsthetic aspect was almost nil; but I have found a compound prepared by myself according to a suggestion in "Les Nouveaux Remèdes," for February 15th, 1886, of value; it is non-irritating and keeps well in an aqueous solution or in eugenol. It is prepared as follows:—

R	Crystallized Benzoic Acid	...	...	...	1 part.
	Cucaine, pure	...	...	...	3 parts.

Distilled water q. s. to form a 20 per cent. solution. Eugenol may take the place of water if desired.

Doubts have been raised as to the safety of cucaine as a therapeutic agent subcutaneously injected, owing to some alarming symptoms having been recorded as occurring in a few cases; it is even stated that one death has resulted from cucaine applied to relieve the pain of a decayed tooth (*vide* this case, reported to the New York Medico-Legal Society by Professor R. Ogden Doremus). We shall doubtless continue to hear occasionally of cases in which the administration of cucaine has given rise to symptoms which may have caused alarm and anxiety; we occasionally hear of cases in which a dish of oysters or a glass of cold water have caused alarming symptoms when taken internally, and even cheese is not free from this charge (*vide Lancet* for May 15th, 1886, page 941). But I think the fact of cucaine having been employed internally, by injection, and by local application, in some thousands of cases with success and satisfaction to the patient and operator, whilst only one *reported* case of death is recorded against it, speaks very favourably of its therapeutic value.

It is, of course, important that a recent, carefully prepared, and pure alkaloid or salt should be employed. It is possible that some of the alarming symptoms that have been recorded were due to the employment of an old, decomposed, or imperfectly prepared sample of the drug. I have myself found considerable difference in the effect produced by the injection of various samples of

cucaine into parts of my own body. The action of hydrochlorate of cucaine varies considerably according to the make, age, and condition of the leaves from which it is obtained. Some preparations dissolve slowly, and are less rapid in their action on the parts to which they are applied, while their anæsthetic effects continue sufficiently long to allow of the operation being properly performed; the anæsthetic effects of others that are quick to dissolve and to act are of but short duration. The important difference of results of the action of cucaine may be owing to impurity or partial decomposition of the alkaloid, to the method of preparing it, or to the source and quality of the leaves from which it is obtained. Therefore, until we are at all times supplied with a reliable preparation, and are better acquainted with its statistical and symptomatic therapeutics, its administration should be conducted with care and discretion; unless this is done uncertain results may follow.

Tests for Cucaine.—There are few alkaloids so sensitive to chemical and physical action, and solutions of it and its salts do not keep for any length of time without decomposition. Weak solutions (4 per cent.) of cucaine are liable to the rapid development of fungoid growth, and possess the power of exciting inflammation in the mucous membrane to which they may be applied. This development of fungoid growth does not readily occur in strong solutions (20 per cent.) of the alkaloid; it is important, therefore, that some reliable tests should be adopted, and only the freshly prepared products employed. Several tests have been suggested, and amongst them the following may be mentioned. According to Herr Beckurts' opinion, pure hydrochlorate of cucaine should dissolve clear and colourless in water, volatilize completely from platinum foil, give a colourless solution with pure concentrated sulphuric acid in the proportion of one centigramme to 0.5 c.c., and a concentrated aqueous solution should be absolutely neutral, not immediately reduce potassium permanganate, and when heated with excess give off no odour of oil of bitter almonds. As additional tests for the identification of cucaine, Herr Beckurts recommends to heat a little of the alkaloid with alcoholic potash, when the characteristic odour of benzoic ether should be given off, or the addition of a little perchloride of iron to a solution of the alkaloid in sulphuric acid, which should give rise to a yellow turbidity that disappears on warming. Dr. Giesel states that one

centigramme of hydrochlorate of cucaine dissolved in two drops of water is precipitated by a solution of potassium permanganate (1 in 330), a violet insoluble salt of the alkaloid being produced; sometimes very fine microscopic crystals of the salt make their appearance. Professor Fluckiger states, if cucaine or its salts are heated with sulphuric acid (1.84 sp. gr.) an abundance of white acrid vapours are given off; on cooling they deposit crystals of benzoic acid on the walls of the tube. This reaction may also be performed with a minute quantity of the alkaloid. Professor Bignon (of Lima, Peru), gives the following as characteristics of cucaine, which is good for therapeutical purposes:—It should be white, almost inodorous, entirely soluble in three parts of alcohol, in two parts of sulphuric ether, in chloroform, in sulphide of carbon, and in twenty parts of benzine prepared either from tar or petroleum. Professor Bignon believes that the dilation of the pupil is the property inherent in cucaine, and attenuated in its salts; and, furthermore, that solutions which do not produce this dilatation have undergone a commencement of decomposition, and contain a derivative body, unfortunately easily produced, which is very soluble in water, uncrystallizable, and appears to resemble a glucoside.

For the Preservation of Cucaine and its Salts, it has occurred to me that Limousin's method of preparing and preserving solutions of morphia for hypodermic injection might be employed with advantage. It consists in first sterilizing small glass globules of more than a cubic centimetre capacity, and having a long drawn-out neck, by heating them in a stove to about 200 ° C. These are filled with the solution, either by introducing the end of the neck of the heated globule into the cold liquid, or by injecting the hot liquid by means of a finely pointed syringe. The end of the neck is then sealed in a flame. The solutions are prepared hot, with water that has been boiled and previously filtered through a Chamberland filter. Mons. Limousin rarely uses distilled water, as he considers the salts present in ordinary water retard the invasion of fungi. Solutions of morphia and ergot so prepared have remained intact for upwards of a year. When required for use, the fine neck of a globule is broken off, and a sufficiency of the liquid taken up in a syringe direct.

I have now under test solutions of cucaine thus prepared, and hope to give the result of the experiment in due time. Solutions

of 1 gr. and 2 grs. in 10 and 20 minims of water thus preserved would be a great convenience to dental surgeons, as well as to the general practitioner.

Of the *Physiological Effects of Cucaine* that have been recorded, the following, as stated by Dr. D. R. Brower, of its action upon the nervous system, are of interest:—"Cucaine in small doses is a cerebral stimulant, but produces derangement of the digestion and assimilative functions, and diminishes the elimination of waste. The use of cucaine in mental depression, if we carefully guard against the depressing effects of the drug upon digestion and assimilation, will often give better results than any other drug hitherto used. The use of cucaine in neurasthenia is a valuable addition to the treatment. The drug, if administered in large doses persistently, causes a very marked deterioration of the central nervous system, producing a profound cerebral neurasthenia, and may produce such a malnutrition of the cerebrum as to develop insanity. Cucaine occasionally, in doses heretofore regarded as small, has produced alarming depression of the central nervous system."

In the case of a morphia-maniac, to which Mons. Castelain had been called, seventeen grains of cucaine were injected in the course of five days, with the view of superseding the practical injecting of morphia. The heart's action became seriously depressed, but the patient was well on the following day.

Dr. Caudwell, who has experimented on himself with large doses of cuca and cucaine (viz. 2 drachms to 2 ounces of the fluid extract, equivalent to its own weight of leaves, and $\frac{1}{2}$ to 5 grains of cucaine), says that a dose of 2 oz. of the fluid extract of cuca caused giddiness and unsteadiness of gait for ten minutes, and then a general sensation of well-being; this nearly corresponds with my own experience with the fluid extract, after a dose of one fluid ounce, which was followed by the same sensation of well-being and content, and of wakefulness, with ability to read and write for many hours, a feat I could not otherwise have accomplished without severe headache. Both the leaves and the fluid extract appear to me to have an exhilarating and stimulating effect upon the nerves, bracing and clearing the mind and body for further work when such would scarcely be otherwise possible; and this is followed by no ill-effect other than the natural reaction of fatigue consequent upon extraordinary exertion. One or two drachm

doses of the fluid extract are also useful as an astringent in recurrent hæmorrhage of the rectum from piles, and similar doses of this preparation have proved of great benefit in two cases with which I am acquainted in allaying persistent vomiting due to excessive sensibility of the nervous and muscular organs of the stomach. Dr. Caudwell says that a dose of 5 grains of cucaine hydrochlorate caused toxic symptoms with himself; these passed off in two hours, except the dilation of the pupils, which lasted six hours. From his experiments, he concludes that cuca and cucaine exert a double action, being cerebral sedatives in small doses, and cerebral stimulants in large doses; that cucaine, given internally, dilates the pupils and possesses no toxic action except in large doses. The dilation of the pupil, and paralysis of accommodation caused by it, are of shorter duration than with atropine. When applied to the eye in cases of intolerance of light it acts like magic.

The Toxic Properties of Cucaine.—Several cases have been recorded in which the administration of cucaine has been followed by toxic symptoms. In one case, by Dr. Schilling (*Medical Chronicle*, February, 1886), six drops of a 20 per cent. solution had been injected into the gums of a woman, aged twenty-eight, to facilitate the extraction of a molar tooth. After the removal of the tooth, and when the patient was about to leave, her countenance became rigid, and she appeared faint, and in spite of the administration of stimulants, she became unconscious. The eyes remained widely opened, and ophthalmoscopic examination showing contraction of the retinal arteries, it was reasoned therefrom that there was contraction of the arteries of the brain, and the experiment was made of administering nitrite of amyl. After the inhalation of three drops from a cloth the woman's face flushed and she spoke, and a second and third inhalation at intervals of a few minutes resulted in complete restoration.

A case is also reported in the *Chicago Medical Journal*, in which alarming symptoms were produced by the application of cucaine to the nostrils to relieve hay fever. Some minutes afterwards the patient became dizzy and semi-comatose, the pupils being widely dilated and the temperature high. By the administration of brandy, ammonia and digitalis, she recovered in about three hours, and next day experienced no further ill effects.

On the other hand, a case of attempted suicide has been

recorded (*Varge's Zeitschr*) in which a dose of 23 grains appeared to have no very injurious effect. In another case a correspondent (in the *British and Colonial Druggist*), who possessed a highly sensitive nervous organization, had taken a series of doses amounting, in the aggregate, to 32 grains of the hydrochlorate within the space of three hours without serious results.

Therefore, although cucaine has been shown to be poisonous if allowed to enter the circulation rapidly, and in sufficient dose, killing small animals by paralysing the heart, the fatal dose for human beings would appear to be very considerable.

Antidotes.—*Nitrite of Amyl* would appear from the foregoing remarks to be a valuable antidote to the toxic properties of cucaine. It may be obtained encased in glass capsules containing from 1 to 5 minims; for practical purposes the 3 minim size is most convenient; these may be obtained in boxes of 1 dozen capsules in each. The dose by inhalation of the vapour is from 2 to 5 minims, by the mouth $\frac{1}{2}$ to 1 minim. In 30 to 40 seconds after inhaling or swallowing a dose, the face becomes flushed, and the heat and perspiration of the head and neck are increased. In chloroform syncope, nitrite of amyl affords the quickest means of restoring the heart's action.

Mr. Gaddes has suggested to my notice the use of nitroglycerine as an antidote to cucaine. Fortunately I have not as yet been called upon to employ either of these agents for the purpose indicated, therefore I cannot speak of their properties from personal experience; but judging by its therapeutic and physiological effects, I should say that nitroglycerine would prove of great service as an antidote to cucaine, for it quickly accelerates the pulse, relaxes the arteries, and produces a feeling of fulness over the body, and causes a throbbing at the sides of the temples. Its action in the treatment of angina pectoris, asthma, headache, and neuralgia, resembles that of nitrite of amyl, but its effects are more durable. *The dose* is $\frac{1}{200}$ to $\frac{1}{50}$ grain increased to $\frac{1}{10}$ grain. It is obtained by the addition of glycerine to a mixture of sulphuric and fuming nitric acids kept cool by ice water; it is then separated and freed from acidity by agitation with cold water. The dense oily liquid thus separated is then carefully dehydrated in thin layers in a warm room, when it becomes transparent, colourless, and of a sp. gr. 1.600. It is slightly soluble in water, freely soluble in absolute alcohol and ether, 1 in 15 of rectified spirit, and 1 in 6 of

almond oil. Dynamite is a combination of three parts of nitroglycerine and one part of infusorial earth.

Chocolate tablets, each weighing $2\frac{1}{2}$ grains, and containing $\frac{1}{100}$ of a grain of pure nitroglycerine in each, are the most convenient for general use. Nitroglycerine is soluble in oils and fats, and oil of theobroma is a suitable medium of combination; a one per cent. oily solution is more stable than an alcoholic solution. Nitroglycerine, especially if impure, is liable to explode spontaneously, but if combined with fats or oils this danger is obviated.

DENTAL APPOINTMENTS.

A Paper read before the Students' Society of the National Dental College.

By W. J. FISK.

MR. PRESIDENT AND GENTLEMEN,—

The subject that I propose to now bring before your notice this evening is one that I do not think has hitherto been discussed before this Society, but which yet deserves our most earnest attention. Many in this room will doubtless, at some future period of their career, become connected with one or other of our charitable institutions which have for their object the relief of suffering humanity, by acting in the capacity of Honorary Dental Surgeons, and the questions for us to consider are—Is the work done by the hon. dentists at many of those institutions of such a character as to elevate dental surgery in its true sense, and maintain its reputation as a scientific profession? and, secondly—In what way are we to bring the full benefit of our training to bear in the treatment of those patients who seek dental aid at the hands of the dental practitioner appointed for that purpose?

I have had more knowledge of provincial than metropolitan institutions, and as far as my personal experience has extended, I have found the dentist attached to these places attending generally one hour each week to extract teeth, the only instruments in use being forceps; and yet this gentleman was probably selected from a number of candidates, and presented testimonials as to his ability to practice dental surgery (not tooth extraction) for the benefit of the patients. Would not the subscribers think that, when a qualified dentist was appointed, the patients would obtain the benefit of the improved system of education now existing in

our dental schools, and which they would naturally expect the dentist to exert. But what is the practical result? In many cases the principles of dental surgery are entirely misrepresented, and the dentist is to his patients merely a practitioner whose operative skill is limited to tooth extraction.

That there is a difficulty in treating dental cases I am well aware. The doctor can do the greater part of his work by giving advice and writing a prescription; whereas the dentist must perform practical work which takes up a good deal of time. Yet even this difficulty could be overcome (at least in the larger provincial hospitals and charitable institutions) by having in the case of the former a number of dental appointments, the holders of which should consist of the local practitioners.

Take, for instance, an infirmary I am familiar with, which exists in a town of over 100,000 inhabitants. A dental surgeon was attached who was selected on account of his superior ability, yet the only dental work done is the removal on an average of about ten aching teeth per week. Now, supposing there were a dental department connected with this institution, and other practitioners allowed to join it, do you not think that dental surgery at that institution could show better results, and be more creditable to the dental profession? I contend that the system of appointing only one man to large institutions is bad, as he cannot possibly do the work naturally expected of a skilful dentist, and the result is that dentistry degenerates into tooth pulling. In some of the smaller institutions and dispensaries where an hon. dentist is appointed, the same state of things exists.

I was speaking to a gentleman connected with a large provident institution, when the subject of dentistry was mentioned in course of conversation. He informed me that dentistry was performed at their club by the dispenser himself, and consisted of the usual extraction of decayed teeth. Now, gentlemen, what must be the opinion of the medical staff connected with that institution when they see dentistry represented by such inefficient means? In my opinion the work carried out by a dental surgeon at some of these institutions is most unsatisfactory to those who have the interests of the profession at heart, and are anxious that the results of their skill should be of such a character as could not fail to be appreciated.

Let us compare this work as before described with that of the

dentist's medical colleague at the same institution, one bringing the whole force of his training to bear upon the case for the benefit of the patient ; whilst the other, whose training collectively has been equally severe, utilizes but a small portion of it in performing work that could be done by anyone who had had a few weeks' experience in the extraction room of a dental hospital. Can we expect the medical profession to have a very exalted opinion of its dental branch when they see in the extraction of a few decayed teeth the sole results of the dentist's training ?

It has been suggested that dental surgeons should be appointed to all our workhouses, infirmaries, and other public institutions, so that the inmates might reap the advantage of the labours of a skilled practitioner ; but I do not think that those in power can be very anxious to create a post for gentlemen whose efforts in other institutions show such a meagre result ? I have met many medical men whose knowledge of dentistry was very vague, and who imagined that the great aim of a dentist was to extract teeth. This cannot be wondered at, considering that a large number of them form their opinions on dentistry through seeing the dental work at the institutions to which they are or have been attached. We will imagine for a moment that if the gentlemen who rule these institutions, and with whom the appointment of a dentist would probably rest, were to spend some little time in investigating the working of a dental hospital, they unquestionably would have a far higher opinion of dental surgery. They could observe the far-reaching results of the dentist's skill, and would see that it would become imperative upon them to confer the same benefits upon the inmates under their charge by securing the services of a trained dentist.

Dentistry has vastly improved during the last decade, and the tendency of the present day is to increase the severity of the training, and elevate the standard of the student's professional education, so as to increase his usefulness. Therefore you must admit that with the advantages he at present possesses in acquiring knowledge, more will be expected from him than the skilful use of the forceps. I strongly feel that the present system could be improved upon, and dentists be able to take a greatly superior position, and not only would they benefit their patients, but at the same time educate both them and their medical colleagues to the advantage of dental surgery.

I should like to see a strong expression of opinion evinced by the teachers of the profession as to what the duties of an hon. dental surgeon should consist of. A standard of efficiency could then be fixed which would govern these cases, and men on taking up these appointments would know the extent of the work to be accomplished, and the patients what to expect. It is not for me to define this extent, I leave that for others with more experience; but at all events it would be a fit subject for discussion. Whatever may be the opinion arrived at, I feel confident that dental surgery can be applied in a very different way from what it is at present. At our dental schools we get dental surgeons who teach us that it is of far greater importance to save than to extract, and who impart the full benefit of their training and experience to us. If the other dental surgeons attached to hospitals, &c., worked a little more in this direction, it would greatly increase their efficiency, and induce a heartier recognition from the medical profession in general of the benefits of dentistry, and help to raise the reputation and increase the value of dental surgery.

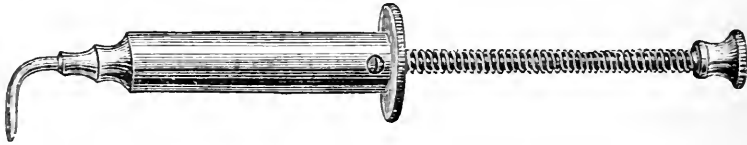
It may possibly be thought that this is not a fit subject for a students' society, but considering that many gentlemen who are present will, in the future, represent the profession as honorary dental surgeons at public institutions, any information which will enable them to raise the standard of work, benefit the poor, and at the same time educate those in immediate contact with them, to the advantage of modern dental surgery, is surely of importance both to students and the profession in general.

ON A NEW FORM OF DENTAL SYRINGE.

By W. A. HUNT, L.R.C.P.Lond., &c.

IN April, 1870, I published in the *British Journal of Dental Science* an account of a new form of syringe for use in dental surgery. Messrs. Ash & Son kindly undertook to make the instrument, but on account of the large barrel and one or two other reasons, the pattern they brought out did not work so well as my own home-made one, which I reconstructed about the same time. This instrument has given me most perfect satisfaction for more than fifteen years; and has again been put on the market by the Dental Manufacturing Company, who have made a most excellent instrument according to my pattern.

After sixteen years' use I may still refer to what I then wrote:—
 “For rinsing away *débris* in excavating, I suppose we all use the syringe. I have tried all kinds, as well as the india-rubber ball with a silver nozzle, but I find that although the india-rubber ball will fill itself by expanding in a tumbler of water, yet it soon wears out; and in the case of the cylinder and piston arrangement, considerable time is lost in filling it, and the metal cylinder rapidly lowers the temperature of the water used, a great inconvenience in syringing a sensitive tooth. I have therefore devised the following plan, which renders this instrument to a certain extent



automatic, and I find it answers admirably; the accompanying engraving will explain this at a glance.”

In using the syringe the act of driving down the piston rod compresses the spring, which is made of hard drawn piano wire; the syringe is thus emptied, and in this state is placed in the operator's tumbler of warm water; the elasticity of the spring draws the piston up, and thus the syringe refills itself by the time the operator is again ready to use it, and as it is still standing in the tumbler of warm water the instrument is kept warm, the patient saved perhaps a stream of water colder than is pleasant to him, and the operator saved time and labour.

The whole instrument is very carefully made, the barrel being absolutely true inside, the spring tough and reliable, and all the parts nickel-plated.

The piston packing wears from one to three years; it is of wash leather, can be renewed in a minute when required, is made to fit snugly to its barrel by fine silk wound underneath it, and is lubricated with vaseline; it works most perfectly.

THE fluid of the stinging-gland of the nettle is generally conjectured to be formic acid. The fact, as mentioned by Mr. Alfred W. Bennett, that the fluid of the gland has frequently, if not always, an alkaline reaction does not accord with that view.

SWALLOWING ARTIFICIAL TEETH.

THE following case of a tooth-plate impacted in the œsophagus and its successful removal by œsophagotomy by Sir William Mac Cormac, at St Thomas's Hospital, is published in the *Lancet*.

It is now generally conceded that the treatment of foreign bodies impacted in the œsophagus, where unsuccessful attempts have been made by the use of forceps, &c., to extract them, should be by an operation—œsophagotomy,—as in the following case. Here the plate, with very irregular and pointed projections had become fixed, and resisted all attempts to remove it. The operation has been a very successful one when undertaken before the advent of inflammation or suppuration about the œsophagus; the chief danger appears to be in delay. The point in the treatment to which Sir William draws attention in his remarks (the closure of the œsophageal wound by suture) is one which will probably be generally adopted in similar cases, as it presents considerable advantages. The notes of the case have been taken by Mr. Cameron Kidd, house-surgeon.

The subject of this accident was a woman, aged thirty-one, of healthy appearance but subject to epileptic fits since childhood. During one of these fits, which took place on Sunday morning, March 14th, the patient swallowed a set of artificial teeth, consisting of a silver plate to which five teeth (four incisors and one premolar) had originally been attached, but one of these (the premolar) had been broken off some time before the accident occurred. When the patient regained consciousness she had some difficulty in breathing and swallowing, and then discovered what had happened. She immediately consulted a doctor, who gave her an emetic, which caused her to vomit without moving the plate, and an attempt to extract them with forceps was made without success. She was then advised to apply at St. Thomas's.

On her arrival at the hospital two hours after the fit, there was no difficulty in breathing, but there was considerable pain on drinking. An œsophageal bougie, carefully passed to ascertain the position of the foreign body, became arrested at a point six inches and a-half from the edge of the teeth. The patient said she could feel the tooth plate from the pain it caused, which she referred to a spot an inch below the cricoid cartilage. Mr. Battle made repeated and prolonged efforts to extract the foreign body

by means of œsophageal forceps of various kinds. The plate was repeatedly grasped by the forceps, and as much force used as was thought justifiable, but all attempts to disengage it failed. Some slight hæmorrhage followed. During one attempt half a tooth was broken off, and was extracted. The plate was evidently flattened against the posterior wall, as the forceps went past it, and it could only be grasped when they were withdrawn a short distance and passed again with the blades open. The patient, who was admitted on March 14th, was seen by Sir William Mac Cormac at 7 p.m., but as there was no dyspnœa or other urgent symptom, it was decided to postpone any further action until the following day.

March 15th.—The respiration is quite easy, but the patient cannot swallow anything, even a small quantity of liquid, and she expectorates the saliva. She complains of severe pain just below the cricoid cartilage, and at the back of her neck. There is some cough.

Operation.—As every possible effort had been made to extract the body by the mouth without success, further attempts in this direction seemed inadvisable. The plate was of very irregular form, with sharp angular projections at each side. It was evidently very firmly lodged in the tube, and was not likely to be extracted without danger of tearing the œsophagus, entailing very serious risk. Sir William therefore decided to perform œsophagotomy, the position of the foreign body being distinctly made out by the bougie and forceps, although nothing could be felt in the neck externally. At 2 p.m., the patient being under the influence of chloroform, the œsophageal forceps was passed and the foreign body again plainly felt at the same point as before. An incision about four inches long was therefore made along the anterior border of the left sterno-mastoid muscle, extending downwards to within half-an-inch of the sternal notch. The superficial tissues were divided until the edge of the sterno-mastoid muscle was reached, and the edges of the wound retracted. The anterior jugular vein, which was somewhat larger than usual, gave some trouble at this point, but was finally drawn inwards with the thyroid body. Several veins required division after the application of a double ligature. The carotid sheath was exposed, the omo-hyoid muscle cut through, and the artery and vein drawn outwards by the finger of an assistant. After dividing about half

of the sterno-hyoid muscle and drawing the thyroid body well over towards the middle line, the œsophagus was exposed, but even then the foreign body could not be felt through its walls. It was feared it might have passed into the stomach. The forceps were again passed through the mouth, but even with them the foreign body was not distinctly felt. As, however, the probabilities were strongly in favour of it not having shifted from the position it occupied before the operation, a longitudinal incision about three-quarters of an inch long was made upon the end of the forceps, and when the lips of the incision were held apart the plate was at once seen closely impacted against the posterior wall of the œsophagus. It was readily seized with a pair of forceps and extracted without difficulty. It was now decided to close the œsophageal wound. An ivory-balled probang was passed to cause the tube to project somewhat, and the edges of the incision were united with three catgut sutures. The external wound was disinfected with a 1 in 1000 perchloride of mercury solution. Two drainage-tubes were inserted, and the margins of the skin united with silk sutures. There was very little bleeding throughout the operation. The wound was dressed with iodoform, salicylic wool, and gauze bandages. The patient was ordered to be fed by the rectum, and not to have anything by the mouth.

March 16th.—On the wound being dressed this morning, it looked well and there was no puffiness. Patient had a nutrient enema at 12 a.m., and a similar one has been ordered every four hours. She has taken nothing by the mouth, and expectorates her saliva. Slept well; no pain. The temperature rose after the operation to 101°, and is now (9 a.m.) 100·4°; at 9 p.m. it was 98·4°.

18th.—The stitches were taken out and the drainage-tube removed. The wound was looking very well. The patient could now swallow her saliva and she was allowed a little milk, which she swallowed easily and without any pain. Nutrient enemata discontinued. Temperature a.m. 99·4°; p.m. 100°. There has been no regurgitation through the wound.

20th.—Last evening some milk came through the wound after drinking. The patient did not mention the fact till this morning, as she was afraid her supply of milk would be stopped. She is a restless, irritable woman, and dislikes the feeling of thirst. On

taking off the dressings and giving the patient milk to drink, some came out of the lower end of the wound, which was perfectly free from inflammation and had healed, except at the spot above and below where the drainage-tubes had been placed. The nutrient enemata were ordered as before and the supply by the mouth stopped. Antiseptic dressings left off. Temperature normal.

22nd.—Wound again dressed; it was looking quite well. On drinking hastily, a little milk came out from the lower end of the wound; a small drainage tube was inserted there. The patient was still allowed to drink milk. The nutrient enemata was discontinued. Temperature, morning 99°, evening 99°. General condition excellent.

25th.—The wound is now soundly healed, with the exception of a small place at the lower extremity. No milk has passed through it for the past twelve hours, not even when the patient swallows quickly. Drainage-tube removed.

27th.—Wound completely healed. The patient had an epileptic fit at 4 o'clock this morning.

30th.—The patient was up on the 28th, and went home to-day. There is a linear cicatrix in the neck, scarcely noticeable. She can swallow as well as before, and without pain or inconvenience, even when taking solid food.

The patient was seen about a month later, and was in excellent health. She had been supplied with a new and securely fitting plate.

Remarks by Sir William Mac Cormac.—This patient was only sixteen days in hospital, having made a rapid recovery. The point of chief interest is the closure of the œsophageal incision directly after the removal of the plate. The introduction of the sutures was a little troublesome owing to the depth of the wound, and I consider the partial failure was due to imperfect closure of the incision, from an insufficient number having been passed. Had four or five sutures been introduced in place of three, this accident might probably have been avoided. The milk, however, only found its way into the wound on the sixth day, when the chance of extravasation into the cellular tissues of the neck would be past, and it soon ceased to escape. This practice appears preferable to introducing a tube into the stomach from the neck or

mouth and allowing the wound to heal by granulation—at all events in cases such as this one, where there were no inflammatory changes in the parts, and the margins of the œsophageal wound were clean cut, and not bruised.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

At the ordinary Monthly Meeting held on May 3rd, Mr. T. CHARTERS WHITE, President, in the chair, Mr. WILLOUGHBY WEISS showed the head of a lamb with hare-lip on the right side which had been sent as a donation to the Museum by Mr. J. T. Fripp, L.D.S.Edin., of Willesden. The specimen had been admirably preserved and mounted by Mr. Sutton. The fissure did not extend to the palate.

The PRESIDENT said the thanks of the Society were due both to Mr. Fripp for his interesting specimen, and to Mr. Sutton for mounting it. It afforded further proof of the fact to which their attention had been called by Mr. Sutton, that man did not monopolize all the abnormalities.

Mr. BETTS exhibited models of the upper and lower maxillæ of a boy aged five-and-a-half years, remarkable for the extreme smallness of the dental arches, and from the fact that the upper incisors had never erupted, whilst three of those in the lower jaw fell out when the child was two-and-a-half, the remaining one being loose at the time of taking the impression. The boy, though delicate-looking, was not under-sized, but the lower portion of his face was disproportionately small.

Mr. J. S. TURNER showed an upper left lateral the labial portion of the root of which was absorbed to such an extent as to lay open the canal. He had extracted it from the mouth of a boy aged twelve-and-a-half, who came to him complaining of pain in the upper teeth which could not be localized, and the cause of which appeared very obscure. The teeth were large, sound, and not crowded. Bearing in mind a case which had been brought before the Society a short time before by Mr. White, of Norwich, Mr. Turner extracted the lateral and found the state of things now seen. On passing a probe into the alveolus the lingual surface of the canine could be felt. It was the pressure of this tooth coming down in front of the other which had caused the absorption and exposure of the pulp, though previous to the

extraction of the lateral there had been no indication whatever of its presence. He, Mr. Turner, thought that this case showed clearly the benefit which might be derived from attending the meetings of the Society, for had it not been for his recollection of Mr. White's case he should not have thought of extracting the lateral, and in all probability the case would have completely baffled him.

The PRESIDENT remarked that absorption of the roots of the second molar from the pressure of a misplaced wisdom tooth was not a very rare occurrence—several such cases had been brought before the Society—but the condition described by Mr. Turner was much less common; he himself had never met with such a case. It required a considerable amount of assurance to extract an apparently sound tooth, such as this was, and he congratulated Mr. Turner on his powers of diagnosis.

Mr. NEWLAND PEDLEY showed a patient on whom he had operated for cyst in the upper jaw, together with a plaster cast of the tumour before operation, and read notes of the case.

The patient, a man aged forty-two, had been suffering for four years from a gradually increasing swelling of the left side of the face. He consulted a medical practitioner, who, after a somewhat hasty examination, pronounced the growth to be malignant, and advised its total removal. Not feeling satisfied, the patient then applied to Mr. F. V. Mackenzie, of Kentish Town, and at his request Mr. Pedley was called in consultation. The swelling, which was as large as a hen's egg, extended as high as the margin of the orbit. There had never been any foul discharge from the nasal passages, nor any symptoms of inflammation of the antrum. Within the mouth a large sausage-shaped swelling could be felt in the buccal sulcus, very tense, but yielding a sense of fluctuation on firm pressure. As the result of his examination, Mr. Pedley came to the conclusion that the disease consisted of a simple cyst, and proceeded at once to operate, making a free incision, an inch and a-half in length, along the alveolar margin, and turning out the contents, which were of the usual semi-gelatinous character, and loaded with yellow shining masses of cholesterine.

The cavity was syringed daily with antiseptic and astringent lotions, and the opening kept patent. Only about three weeks had elapsed since the operation, but the deformity of the face had almost completely disappeared.

Mr. PEDLEY remarked that a point of interest in connection with the case was raised by the question whether so large a cavity in this region could exist independent of the antrum, and whether the antrum had been involved. He should be glad to hear the opinions of members who had taken the trouble to examine the patient.

The PRESIDENT remarked that patients suffering from swellings about the jaws and palate were always imagining that the disease must be cancer, though in the majority of cases they were not malignant, but could be traced to the irritation of some carious or dead tooth. Could any such cause be assigned in the present case?

Mr. PEDLEY replied in the negative.

Mr. CHARLES TOMES related the following interesting case of replantation.

A boy had an upper lateral and canine knocked out at school. No attempt was made to replace the teeth at the time of the accident, but the boy mentioned it when writing to his mother, and she gave directions that he should come to London to have the teeth replanted, and he was accordingly brought to Mr. Tomes five days after the accident. Mr. Tomes felt very doubtful of success after so long an interval, but determined to make the experiment. He therefore removed the pulps of the two teeth, filled the pulp chambers and canals with gutta-percha, and then tried to replace them in their sockets; but this was found to be impossible owing to the contraction which had taken place. He found, however, that the lateral fitted very well into the socket of the canine, and as there was a good deal of crowding, the loss of one tooth was not altogether an evil. The lateral was secured in place by means of a gutta-percha splint, and soon became firm. When last seen, six weeks after the removal of the splint, there was slight retraction of the gum about the neck of the tooth, but no sign of irritation, and the boy did not spare it. Of course time alone would show to what extent this experiment could be considered really successful.

Mr. Tomes also gave an account of an experiment he had made on himself with cocaine.

Being troubled with a tender tooth, he thought it would be a good opportunity for trying the effect of the new remedy. He accordingly dissolved a grain of the hydrochlorate of cocaine in a

small quantity of water, and injected it at the reflexion of the mucous membrane of the cheek and lower jaw, just below the tender tooth. The result was an area of anæsthesia about as large as a five-shilling piece, but it did not abolish sensibility in the tooth. Shortly afterwards, whilst engaged in writing, he became conscious of a most unpleasant feeling of giddiness and nausea, his hands became cold and clammy, and on getting up to pour out some brandy he was slightly unsteady in walking. The symptoms soon abated, without his taking the stimulant, but a feeling of discomfort and nausea persisted for between two and three hours. He thought it well to call attention to the possibility of such effects being produced even by a dose of one grain, since he had seen the injection of a grain and a-half and two grains recommended, and judging from his own experience it seemed to him that these doses might be attended with very unpleasant effects in some cases.

Mr. NEWLAND PEDLEY said he was in the habit of injecting cocaine daily, and had met with no unpleasant after-effects as yet. The great majority of patients said they felt no pain from the subsequent extraction, but he freely admitted that some allowance must be made for mental effect. Thus in one case he painted the gum with carbolic lotion, assuring the patient that it would deaden the pain, then extracted two large teeth, and the patient declared that he did not feel it. At the same time he had no doubt that the cocaine had a good effect in most cases. Thus, in one instance he broke a molar in trying to extract it, and the patient suffered acutely; he then injected cocaine and removed the roots, which were very firmly implanted, and the patient suffered no pain.

Mr. BOYD WALLIS said he was in the habit of using cocaine pretty extensively, and in most cases with very satisfactory results. He had no doubt that it did obviate, or greatly lessen, the pain of extraction. Thus, finding it necessary to get rid of his own left lower canine, he had cocaine injected four minutes before the extraction, and felt very little pain; he believed that if the operator had waited two minutes longer he would not have felt it at all. Another very satisfactory case was that of a dog, one of whose lower canines he was requested to extract. He injected cocaine, and removed the tooth, which was quite firm, without the animal giving utterance to a sound. He found it answered

best for front teeth, since in the case of back teeth it was more difficult to inject the solution.

Mr. J. S. TURNER remarked that it was impossible to obtain trustworthy results from experiments of this kind if the patient was informed of the object of the application. The late Mr. W. G. Bennett made a number of experiments with electricity as a means of obtunding sensibility before extraction, and obtained very satisfactory results. At last he thought of disconnecting the wires from the battery, the patient being aware of the effect they were intended to produce, and the result was still successful. In fact, it was well known that with the majority of patients the most surprising results could be obtained by working upon their imagination. If reliable results were desired, the patient should not be informed of the object of the experiment.

Mr. S. J. HUTCHINSON said it might be well to remind those who had not yet tried cocaine in dental practice, and who might be desirous of doing so, that a freshly prepared solution should always be used, since it would not keep; in fact, it soon became absolutely poisonous.

The PRESIDENT said he was sorry Mr. Hunt, of Yeovil, was not present to give his experience of the value of cocaine in cases of extraction. He understood that Mr. Hunt had used it largely, with very satisfactory results.

He could fully endorse what Mr. Hutchinson had said as to the importance of using only a freshly prepared solution of cocaine. He had been astonished at the rapidity with which dense masses of fungus developed in it.

Mr. J. H. REDMAN, of Brighton, exhibited and presented to the Museum several specimens of abnormal teeth, including two good examples of three-fanged lower molars, a wisdom tooth with four fangs, another with roots bent at right angles, which of course was not extracted without difficulty, geminated roots of deciduous central and lateral incisors, and several specimens of calcification of the pulp. One of the last-named specimens belonged to a lady, several of whose teeth had been found to be similarly affected, and another to a patient who was suffering from ptosis, which soon disappeared after the extraction of the tooth.

Mr. Redman showed also a lower bicuspid, the root of which had been absorbed, and to which the following history attached.

About a month before the tooth came out the patient accidentally bit upon a shot; this caused severe pain in the tooth, which lasted for several days. The tooth then became loose, so much so at last as to be a source of considerable annoyance, and the patient removed it.

He then read notes of the following instructive case of necrosis of the lower jaw.

A man, aged thirty, came to him with a very tense hard swelling on the left side of the face, extending well down the neck; the angle and base of the lower jaw could not be felt. The patient complained of severe deep-seated pain, great difficulty in moving the jaw, and bad taste in the mouth from the constant presence of pus. He had been attended for some considerable time by a country doctor, who had ordered various kinds of outward applications, but had never examined the mouth, though the swelling had been steadily increasing in size.

On examination Mr. Redman found that all the teeth were perfectly sound, with the exception of the first lower molar, which was badly decayed and the pulp dead. An alveolar abscess had resulted, and its career being unchecked, the pus had infiltrated into the spongy part of the bone, which in this region is deep, causing necrosis of the whole of that side, from the ascending ramus to the symphysis. The teeth, from the wisdom tooth to the central incisor, were so loose that they could be removed with the fingers. A sinus opened near the wisdom tooth, another near the first molar, and a third opposite the lateral incisor, through all of which pus of a most offensive character exuded, and on passing down a probe the bone could be felt completely denuded of periosteum and partly detached. Fortunately, no opening existed through the cheek, although every effort had been made to promote one.

Mr. Redman removed the teeth, which were bathed in pus, and about a week later the necrosed portion of bone exfoliated in three pieces. The patient made a good recovery, scarcely any disfigurement resulting.

The case showed the serious mischief which might result from what was usually considered a very trifling ailment, viz., alveolar abscess, and the importance of calling in dental aid in all cases of swelling and pain in the region of the jaw. An examination of the mouth seemed often to be the very last thing thought of by

the ordinary medical practitioner, instead of which the state of the teeth should at once be ascertained in any case at all resembling the above.

The PRESIDENT then called upon Mr. Storer Bennett to read his paper

ON SOME RECENT ADDITIONS TO THE MUSEUM OF THE
ODONTOLOGICAL SOCIETY.

The Museum of this Society has lately been enriched by the addition of numerous specimens of normal and morbid anatomy, both human and comparative, some of them being examples altogether new to the collection. And while our hearty thanks are due to all those who have presented specimens to the Society, one gentleman, Mr. Bland Sutton, is, I think, especially deserving of our thanks for his numerous contributions of unique illustrations of many interesting points in comparative dental pathology, which show the disastrous consequences that may occur to the lower animals when the subjects of accident or disease.

It has been suggested that if a few of the specimens lately acquired by the Society were exhibited and briefly commented upon, it might prove not uninteresting to the meeting, and that members might be stimulated to acquire an increased number of specimens for presentation to the Society's collection.

In the skull and mandible of a female Dugong (*Hallicore Dugong*) the Society has obtained a most valuable acquisition, for it previously possessed but two incisors (male) and a solitary molar to illustrate the dental armature of this most curious creature.

In this specimen the permanent incisors (the deciduous ones being already shed) scarcely protrude through their bony sockets; they are solid throughout and gradually diminish in thickness from the base to an obtuse rugged point, whereas the male incisors are of the same diameter from base to apex, where they are obliquely bevelled to a sharp edge like the scalpriform incisors of a rodent. The base of the male incisor is hollow and contains a large mass of pulp necessary for the production of this tooth of persistent growth; the pointed extremity of the tooth projects beyond the jaw, elsewhere it is covered in by solid bone. Not so, however, in the female; in her the base of the incisor is suddenly enlarged, bent obliquely outward, and presents a shallow excavation. It is

remarkable that the wall of the socket over the expanded base of the incisor tooth in the female Dugong is always deficient, presenting a somewhat cribriform appearance, and marks a characteristic difference between the sexes.

There are no true permanent incisors in the lower jaw in either male or female. Of the twenty molar teeth, which is the full complement the creature possesses, the present specimen has but six: of these, however, the fourth and fifth molars are the most characteristic, and of these we are fortunate in possessing three of each.

The fourth molar is cylindrical in shape, slightly bent, the crown being flat or slightly excavated in the centre. The fifth molar is much larger than any of the others and later in appearance, so that by the time it comes into use some of the anterior molars have become absorbed and extruded from the jaw. No enamel enters into the structure of these teeth, the Dugong's molars consisting only of a central mass of dentine thickly encased by cementum.

Two interesting examples of dental disease occurring in Marsupials are afforded by the lower jaw of a *Hypsiprymnus* and half the skull and mandible of a Kangaroo.

In the former (*Hypsiprymnus*) the two lower incisors were broken during life, giving rise to two alveolar abscesses, and leading to such considerable necrosis that the right premolar (so peculiar and characteristic in this creature) has been destroyed and extruded.

In the Kangaroo extensive absorption of the alveolus has taken place, causing loss of the premolar and all the molars in each jaw except the last. The appearance forcibly reminds one of that which is presented by a senile human jaw which has long ago parted with the teeth of its youth.

The skull of a Rabbit in which an ununited fracture of the lower jaw, with the formation of a false joint, has taken place, affords a good example of the mischief which may arise in creatures possessing teeth of persistent growth, when from accident their normal antagonism is not maintained. In this specimen the lower incisors are, from want of wear, excessively long, and the left upper incisor pierced the gum of the right lower jaw, causing periostitis and deposit of new bone where the sharp edge of the tooth came in contact. Some of the molars also, from non-

approximation, have become excessively long and laterally deflected.

In the skull of a Lion affected with rickets we have obtained our first example of the king of the forest; but it is interesting pathologically rather than anatomically, for the bones are so immensely thickened, that although the teeth are very large, nothing like the whole of the crowns appear through the openings in the alveolus, and during life merely the points of the cusps pierced the mucous membrane, which itself was enormously thickened. In consequence of the teeth never having been subject to wear, the sharp edges at the back of the incisors and on the margins of the canines are very accurately preserved. The specimen contains in the upper jaw one incisor (the third), the canine and three premolars; the little true molar is missing. In the lower jaw the true molar, which is of course the carnassial tooth, is preserved.

In the skull and mandible of an African Warthog (*Phacochærus Æliana*) the Society has acquired another specimen of which no previous example existed in its collection.

Of all the hog tribe no member is more interesting in its dentition than the *Phacochærus*, for its third true molar is so large and peculiar that it is without rival for its size, compared to the jaw which contains it, in any living mammal with the single exception of the elephant.

This third true molar is laterally compressed, but greatly prolonged in an antero-posterior direction; the grinding surface of the tooth presents three parallel rows of tubercles, which are the worn extremities of a number of enamel cylinders surrounding a core of dentine, the whole being fused together by cementum. About eight of these cylinders appear in each row. The tooth is continued of the same size and shape without any differentiation into crown and fang, quite to the base of the jaw, where its formative pulp being preserved in an active condition continues to produce new tooth substance in compensation for that which is worn away until an advanced period of the animal's life.

If the third molar of *Phacochærus* be compared with that of the wild boar, with *Sus babirussa*, or with any other member of the hog tribe, the remarkable development of the tooth in the former creature will be at once apparent.

Additional interest is lent to the present specimen from the

fact that an alveolar abscess has developed in the right side of the lower jaw, which has burrowed and pointed on its under surface. The bone is here rough and thickened, and cloacæ bear evidence that necrosis has supervened.

The class of Ungulata has lately been enriched by the acquisition of a skull and mandible of a young Hippopotamus. The incisors, two in number in each jaw, are but partly erupted, as are also the canines; in the upper jaw the second, third, and fourth premolars, and the first, second, and third true molars are *in situ* on the right side; the first premolar on both sides, and the second and third on the left being already shed; the fourth true molar on both sides is unerupted.

In the lower jaw the fourth premolar and the first, second, and third true molars are in place, the fourth true molar being still hidden in its bony crypt, while the three anterior premolars have been shed.

The Hippopotamus is becoming so scarce that I think the Society is to be congratulated on acquiring so fine a specimen which will serve as the complement of the adult Hippopotamus, skull it has so long possessed.

A specimen of the so-called "Riggs' Disease" occurring in a monkey (*Cercopithecus lalandi*), is not only interesting from the evidence it bears that the lower animals, as well as man, are subject to this affection, but from the circumstance that the disease has attacked chiefly the buccal surface of the molar and premolar teeth in the upper and lower jaw; the lingual surface of the lower incisors, the position which in the human subject is the commonest for deposits of tartar, being here comparatively free.

The last series of preparations to which I wish to draw the attention of the members consists of the crania and lower jaws of two adult Gorillas, and a series of bones of other parts of the Gorilla's skeleton. The skulls have been previously described; one, however, in addition to its anatomical interest, is also pathologically so from the fact that it bears evidence of previous injury, which has caused extensive destruction of bone in the neighbourhood of the orbit, malar region, anterior nares, &c.

The bones of the skeleton have been arranged on a board side by side with their corresponding human ones, and it is very interesting to compare the relative proportions of the upper and lower limb in the two cases. In the gorilla the upper limb is

immensely larger than in man, as may be seen by comparing the enormous scapula and extremely long humerus, radius and ulna of the gorilla with the much smaller human bones. In the lower limb the converse holds; here the human femur, tibia and fibula are very much longer than those of the gorilla.

The sacrum in the gorilla is longer but narrower than its human prototype. The spinous processes of the vertebræ are in the gorilla remarkably long, and it possesses thirteen ribs and thirteen dorsal vertebræ to support them, instead of only twelve in the human subject.

After some observations by the President and others, the Society adjourned.

TUMOURS OF THE ORAL REGION.

AT a meeting of the Pathological Society on the 17th ult., there were exhibited several cases of interest to the dentist. Specimens of

ADENOMA OF THE PALATE

were shown by Mr. JONATHAN HUTCHINSON. The first was a slowly growing and slowly ulcerating tumour situated at the junction of the hard and soft palate; it occurred in a lady aged thirty, and had grown for one year, was ill defined at its edges, and ulcerated in its centre down to the bone, which could be struck; it was curious that no inflammation had occurred around it. Sir James Paget agreed that it was a most unusual form of growth. It was freely removed ten years ago, and had not recurred, neither had the glands been affected. The second case was also a quiet ulcerated tumour with bossy edges, and situate in the same place. It appeared in a gentleman aged forty-five, and also without any glandular implication. This was also freely excised six months ago. The structure of it was that of an adenoma, like the salivary glands in places and the tonsil at other parts. The ulcer had the appearance of a large open follicle of the tonsil, at the bottom of which a cheesy mass of very fetid substance existed; this ulcer did not expose the bone as in the first case, and there had been no recurrence. The literature did not throw much light upon such cases, few authors mentioning the ulcerative quality of the tumours. The specimens also

differed in not being encapsuled, most of the palatal adenomata being encapsulated.

Mr. BARKER referred to an adenoma of the palate that Mr. Christopher Heath had removed; it also presented the fetid caseous material in its base.

Mr. HUTCHINSON, jun., showed a

NEUROMA OF THE PAROTID GLAND,

one inch in its longest diameter, taken from the left parotid by Mr. Warren Tay. It shelled out with the greatest ease, and the operation was followed by facial paralysis. The tumour was composed of minute round or oval bodies, from $\frac{1}{400}$ th to $\frac{1}{2000}$ th of an inch in diameter, which broke up into concentric capsules, like the layers of an onion. Each had a concentric arrangement of cells and fibres, like end bulbs; There was no doubt of the existence of nerve fibres. The tumours probably developed on the branches of the facial nerve trunk. Reference was made to some observations of Kindfleisch and of Czerny on plexiform neuroma; but the specimen shown seemed to be unique.

Mr. BUTLIN said at first the specimen reminded him of a neuroma figured in Virchow's *Die Krankhaften Geschwulste*; but this was not the case. He had not been able to find either picture or description of a similar specimen, which must therefore be exceedingly rare.

Dr. HALE WHITE did not regard the concentric bodies as of so highly developed a nature as end bulbs; and end bulbs, on a motor nerve like the facial, would be very unlikely to occur.

Mr. HUTCHINSON, in reply, alluded to the fact that there were sensory nerves in intimate relation with the parotid gland.

A specimen of

SECONDARY EPITHELIOMA OF THE LOWER JAW,

removed by Mr. Christopher Heath at University Hospital from a man aged fifty-five, was also exhibited. The primary growth was first noticed in the lower lip two years and a half ago, and was excised two years ago. A year ago the secondary growth began to form, and on admission there was a swelling surrounding the body of the lower jaw, and involving the tissues in the left sub-maxillary space. The tissues removed consisted of the left half of the body of the lower jaw, together with the angle and a small

portion of the ramus, considerable portions of the masseter, internal pterygoid and mylo-hyoid muscle, and the left sub-maxillary gland. The jaw was only superficially diseased by extension of the growth to it. The patient's recovery was rapid and complete. The growth was a squamous epithelioma, and the only unusual feature of it was that, though it must have primarily formed in the lymphatic glands, it had so encroached upon the jaw as to simulate a primary growth in that bone.

At an ordinary meeting of the Clinical Society of London, held on March 26th, Mr. CLUTTON read the notes of a case of

TUBERCULAR ULCERATION OF PALATE.

The patient was a girl aged fifteen, who had been under his care about nine months. Her family history gave no evidence of a phthisical tendency. In her previous history it appeared that she had been in the Evelina Hospital for six months under Dr. Goodhart, who had described her condition in his book on Diseases of Children as a typical case of scrofula. In July, 1885, a year after leaving the Evelina Hospital, she was sent to Mr. Clutton at St. Thomas's Hospital. The soft palate was then found to be divided by a medium cleft, and the whole of the surrounding tissues swollen and superficially ulcerated. The surface was finely granular, and numerous small pit-like ulcers were distributed over the hard palate at a distance from the medium fissure. The glands beneath the jaw were large and hard, as also were those in the left groin. The lungs, examined by Dr. Acland, were reported to be fairly healthy. During September the surface of the palate, previously ulcerated, almost entirely healed, but one auditory canal and the interior of the nose were found to be affected with a similar condition. In October the larynx was examined by Dr. Semon, when the epiglottis and arytenoid cartilages were seen to be ulcerated in the same manner. In November the lungs were found by Dr. Acland to have undergone a marked change, the right apex showing signs of active disease. The temperature, taken regularly about this time, recorded only a slight rise of the thermometer at night. In February of this year the palate had again broken down, and was occupied by three deeply cut ulcers. The right cheek also was now covered with scattered scaly papules, like

the early stage of lupus. In March the lungs were found again to have improved, showing no distinct physical signs of disease. The palate also had again begun to heal. The secretions and small portions of the diseased surface were frequently examined by Dr. Acland and Mr. Ballance, but no bacilli were at any time found.

Mr. T. BRYANT had only seen two cases of lupus of the palate spreading to the larynx: one occurred in a well-to-do lady, in whom there was lupus on the nose and cheek; there were recurrences at long intervals, the tongue and epiglottis being involved after the palate; death took place from acute phthisis.

Dr. FELIX SEMON had seen Mr. Clutton's case. Was it lupus or tuberculosis? He approached the question from a clinical point of view. In September, 1885, there was no affection of the skin or lungs. Isambert of Paris had recorded the first case of faucial tuberculosis, and B. Fraenkel of Berlin followed him. In these cases of pharyngeal tuberculosis, tubercular affections of the lungs were sometimes present; in others totally absent. There was no reason why tubercle should not appear primarily in the mucous membrane. So far as he knew, however, there had been not a single satisfactory case recorded in which the larynx was primarily affected. He could not say from the clinical appearances whether a laryngeal disease were tubercular or lupoid, and the opinion of Schrötter and Stoerk confirmed him in this. But the temporary improvement of Mr. Clutton's case was in favour of the lupoid nature of the disease, and conflicted with the tubercular view taken by him (Dr. Semon) at first; then, after the skin had become affected the diagnosis seemed still more conclusive, and was made still more so by the spread into the nose and œsophagus. He referred to the case of the lady shown that evening. From drawings of the early stage of the disease it appeared that there was a very close resemblance between that case and Mr. Clutton's. With regard to lupus of the larynx, Chiari and Riehl had collected in 1882 all the cases on record, and there were not more than thirty cases. But he questioned whether it was so excessively rare, and believed that if every case of lupus were carefully examined laryngoscopically lupus of the epiglottis might be found more commonly. As to the treatment of lupus of the larynx, there was only one case that had been cured, and that was Chiari's. The best result in all other

cases had been a temporary improvement. In the case of the lady above mentioned aphonia had lasted a year, and there were very large mamillated excrescences; the case seemed most unfavourable, but the patient urged perseverance and now was almost cured; there had been no recurrence for five months.

Mr. DAVIES-COLLEY asked whether all the brothers and sisters had been examined with a view to exclude syphilis as far as possible. The girl had an affection of the eyes, some lumps on the forehead and back of the head, and an ulcer above the internal malleolus of one leg. He admitted that no great improvement of the condition of the soft palate took place under the use of perchloride of mercury, though the leg had improved. He had not seen another case in the active stage, but had seen three or four cases in which a cicatricial contraction of the pharynx had occurred, probably as the result of a similar process.

Mr. MALCOLM MORRIS related the case of the lady aged thirty-five shown that evening. Her disease began in 1867 with ulceration of the mucous membrane of one nostril. This did not advance much till 1876, when it spread outside and affected the upper gum and hard palate; treatment was begun in 1873 with various medicines—cod-liver oil, iodide of potassium and iodine. At the end of September, 1884, Mr. Morris first saw her, when there was very wide-spread disease. The importance of the diagnosis between lupus and tubercle was then discussed. A French observer had said that scraping or scarification of lupus was liable to be followed by tuberculosis of the lung, and argued that it was dangerous to touch lupus for this reason. Lupus was capable of inoculation in animals, and the bacilli of the two diseases were identical. Professor Raudnitz of Prague had collected 209 cases of lupus, and in only two was there tuberculosis of the lung, whilst in twenty-one there was a family history of tubercle. Though there did not appear to be much pathological distinction between lupus and tubercle, yet Mr. Morris thought there was a decided clinical difference. He had surgically treated about forty cases, and had never yet seen any tuberculosis of the lung follow. The slowness of the growth, and the fact that drugs had some influence on tubercle and no effect on true lupus, were clinical differences. Altogether he considered that the identity of lupus and tubercle had by no means been proved.

Dr. GLOVER related the case of a man whose palate was

covered with small superficial, round, painful ulcers. He was admitted into Middlesex Hospital under the care of Dr. Douglas Powell. Numerous bacilli were found in scrapings from the diseased parts. Acute phthisis rapidly developed, and he died in six or eight weeks. There was no history or other indication of syphilis.

Mr. CLUTTON, in reply, said he had not seen the whole of the family; but two others of the nine presented no trace of syphilis. The swellings on the body were observed by Dr. Goodhart, who did not consider them as syphilitic. Rest in bed often caused great improvement in ulcers of the leg. Mr. Davies-Colley said the child had rested in bed.

JOURNALISTIC SUMMARY.

THE DENTAL COSMOS. (*May, PHILADELPHIA.*)

"IS DECAY OF THE TEETH AN INFLAMMATORY OR A CHEMICAL ACTION?" by W. Xavier Sudduth, M.D., D.D.S. The writer questions the assertion of Dr. Abbott that decay of teeth, while differing slightly from caries of bone, is essentially a similar process—it is the analogue of osteitis.

Caries of bone, as is well known, is, Dr. Sudduth proceeds, an inflammatory action. Decay of teeth, in so far as the crowns are concerned, is a chemical action: the inflammatory concomitant is a secondary element. In caries of bone the disease begins in the organic substance, while in decay of the teeth, the inorganic material is first to be affected. In caries of bone the process is vito-chemical. In decay of teeth the order is reversed, and we see a chemico-vital action.

As regards the erosion of the cement and the dentine of the roots of living teeth, when it does occur, I do not think there is any reasonable doubt but that the process is analogous to absorption of bone, and follows the same order. In caries of bone osteoclasts, or giant cells, are an essential element to the carious process. These cells are probably developed from the white blood-corpuscles which have escaped from the capillary vessels. The nourishment of these cells depends upon the close proximity of a vascular supply. In decay of the teeth all these essentials are entirely wanting. Inflammatory *caries* of enamel

or dentine is an utter impossibility when considered from the above stand-point.

A man once started on a wrong theory naturally seeks to bend every appearance in support of the position he has taken and prove its correctness. Thus it is that so many erroneous conclusions are reached by those who reason from preconceived ideas. Dr. Abbott claims that he has seen a *fine* net-work of reticular substance left after decalcifying enamel. Now, I have tried faithfully to preserve and demonstrate this "reticulum." I have taken teeth fresh from the mouth and put them directly into Müller's fluid, handling them with as much care as I would nerve-tissues. After several days I ground sections, not allowing the tooth to dry. After grinding I placed them in alcohol to remove the acid, and then stained them by the best technique known. I failed to discover any "reticulum." Again, I have taken sections thus prepared and decalcified them under a cover-glass on a slide on the stage of a microscope, carefully watching the process from time to time. *Results negative.* The fluid used was one-half of one per cent. solution chromic acid.

Again, to avoid all possibility of error in technique, I imbedded sections of freshly-ground teeth in celloidin, and decalcified them in a one-half of one per cent. solution of chromic acid, stained and afterwards examined them with a Zeis one-twelfth hom. oil im. lens, without being able to demonstrate any organic tissue. By the last-named process it was not possible for the reticulum to disappear through faulty technique. The celloidin, acting as a perfect imbedding mass, was not affected by the acid in the least degree; nor did it hinder in the process of staining, for it is well known that it is more permeable to stains than tissue itself. Further, previous to decalcifying the section, I placed it on a slide, and drew on the reverse side of the slide, with a writing-diamond, the outline of the section. This I used to compare the former outline of the enamel with, by placing the section on it to study. I could thus tell exactly where the reticulum should appear. I did not allow the enamel to be entirely eroded by the acid. The line of demarcation where the decalcifying process stopped was well defined, and no appearance of organized or reticular tissue was to be seen between that portion of the enamel and the line drawn on the back of the slide which marked the periphery of the enamel before decalcification. On the strength of these and numerous

other experiments, made in decalcifying enamel, both in mature and developing enamel, I deny the existence of such a reticular substance.

Above all the before-mentioned conditions which favour decay, I consider the most active agent to be an acid developed at the seat of decay by acid fermentation. Dr. Miller, of Berlin, has very conclusively shown that this fermentation is produced by micro-organisms. He has isolated twenty-two separate forms, and has cultivated them sufficiently to classify them and note their principal reactions, whether acid or otherwise. He says, "Sixteen produce an acid reaction in a solution of beef extract, pepton, and sugar, and for the rest the results were not satisfactory; sometimes the reaction being acid, at other times neutral or alkaline, depending upon the material used for their culture. Some which have an acid reaction in a fermentable solution give rise to an alkaline reaction in non-fermentable solutions."

For the demonstration of micro-organisms of decay we take as large a portion of the soft decalcified mass found in the cavities of decay as we can detach by aid of a broad, hoe-shaped, or other suitable excavator, and place it in alcohol. After the water has thus been removed we imbed in mucilage or celloidin upon cork, and cut sections with a microtome or razor. These can be cut quite thin, as they are completely decalcified *by the acids of the mouth*. After cutting sections, place them in an aqueous solution of any aniline dye, preferably fuchsine. After staining, place in absolute alcohol and remove excess of stain; then dehydrate in oil of cloves or cedar, and mount in balsam. The only acids that come in contact with the specimens are those found in the cavity of decay. The methods necessary for the examination of these micro-organisms are about the simplest of any in use in the study of mycology; and their demonstration the easiest of all the forms we are called upon to study.

In conclusion, it may not be inappropriate to speak very briefly of the position of dentistry in regard to scientific research. I fear that we do not as a body realize the importance of putting all our statements on a scientific basis, and submitting them in a scientific manner. We are too apt to base our theories upon information about different phenomena, instead of building them securely upon active knowledge of visible results. This may have done in the past, but it will not do now. Scientific investigation

is constantly changing the points of view from which we have been in the habit of regarding various pathological conditions; it keeps on presenting new suggestions and new discoveries. To meet this advancement it is required that we subject all our theories to the crucial test of careful experiment. Nor is this all: we must be able to *show* the results from which we draw our conclusions.

The day is passed when simple assertions or drawings of other men's work will suffice to establish a scientific point, and our profession will never be the power it might be until as a body we recognize the true value of the experimental investigation of actual facts wherever these are accessible to study, and demand that all pathological questions connected with our work shall be pursued from a scientific stand-point, and the visible results presented for investigation. If we would be forceful men in the domain of science we must present facts for authority, not authority for facts; we must freely give the methods by which our knowledge is augmented, and allow others to study and weigh our work. Above all must we be prepared to modify our views or abandon them if errors should be discovered and plainly pointed out.

"DENTAL CARIES," by Dr. A. Morsman. This article forms number eight of a series, and deals with the Exposure of the Normal Pulp and its Treatment. Of capping, the writer says he has but little confidence in this treatment, except when the exposure is very slight. His failures have far outnumbered his successes. The operation requires the utmost delicacy of manipulation. The slightest pressure will defeat the object sought. It would be a great boon if some method of pulp-capping could be introduced which would be successful in the hands of all capable operators. Devitalization and extirpation of the pulp is not considered.

REGULATING TEETH is the subject of two articles, both of which are illustrated.

"SEPARATORS." Some new forms are introduced by Dr. W. A. Woodward. These rapid separators are illustrated.

The proceedings of the February meeting of the New York Odontological Society are reported, at which Dr. Truman W. Brophy read a paper on "THE MATRIX: A NEW FORM." He says the

matrix I have designed is in the form of a band, and made of thin spring-tempered steel, and therefore is easily adapted to the irregular form of any tooth upon which it may be placed. The band is doubled or thicker on one side, and is penetrated by a screw the blunt point of which rests against either the buccal or lingual wall of the tooth, and, when set up by means of a watch-key or a lever, fixes the band firmly in place. Having separated the teeth so as to wholly expose the cavity to view, and to enable the operator to restore the carious approximal surface to its natural contour, a band matrix is selected large enough to fit the crown of the tooth quite loosely; the thin steel of which the band is made readily passes between the teeth which are close together and up to the margin of the gum; the screw is then set, and the approximal cavity is thereby converted into a simpler one. These matrices are especially adapted to bicuspid and molars, so that any wall of the two classes of teeth mentioned may be more easily restored by their use.

In filling approximal cavities which dip deep down under the gums, much difficulty is experienced in retaining the rubber dam in position so as to exclude moisture. I have derived great satisfaction and have been highly successful in using a band matrix with an annex designed especially to meet such emergencies. It differs from the others in having a lamina extending gumward, corresponding in width to the cavity to be filled. After the rubber has been placed upon the teeth, the band is placed upon the tooth to be filled, and forced beyond the cervical margin of the cavity, which is clearly exposed to view. Carrying the ligature and rubber before it to the desired point, when the screw, which holds the band firmly in place, is to be set. The moisture is thereby successfully excluded, and the operator is enabled to easily restore the contour of the tooth by filling.

In cases where a considerable portion of the buccal and lingual walls of molars and bicuspid has been lost, I have found the thin band inadequate to the requirements, inasmuch as it will draw into the cavity when the screw is set. I have, therefore, constructed a matrix increased in thickness or of double thickness on both buccal and lingual surfaces, so as to make the band stiffer and give form to the outer surface of the filling. The same result may be obtained by making use of an annex to the thin band, made of German silver, which may be bent to resemble the form

of the letter U and fitted to the tooth, leaving only the sound approximal wall uncovered by it.

Résumé.—Soft or non-cohesive gold is more desirable than cohesive gold or cervical margins, and for the first half of the filling, owing to its ease of adaptation to the tooth-walls and to the rapidity with which it can be inserted. The masticating surface should be made of cohesive foil, my own preference being given to number sixty or higher.

Gold and tin, in consequence of its ease of manipulation, seems to be an excellent material with which to fill the base of larger approximal cavities in posterior teeth; owing to its discolouring, however, it is not suitable for anterior teeth.

The band matrix is simple; it is easily applied to the tooth, and it is securely held in place. The dentist can reduce the time and labour in operating; can easily obtain perfect margins by carrying his gold between the band and the edges of the cavity, and can restore the contour of the tooth to any extent required.

By the use of the band matrix distal cavities, when adjacent teeth are absent, can be more expeditiously and satisfactorily filled than by any other method.

By the use of the band matrix and annex, the large approximal cavities which dip deep down below the surface of the gum can be filled with comparative ease, and in less than one-half the time consumed in filling them without it.

The matrix which has been submitted and described is not the offspring of theory, but an outgrowth of actual practice. It has been tested in a great number of cases, and is presented only after months of experiment and experience. I may be permitted to add that professional friends in my own city and neighbourhood have also used it, and in every instance, I believe, with satisfaction and success.

In the report of the December meeting of the First District Dental Society of New York, there is a long discussion upon the structure and development of enamel and dentine, and on dental caries.

THE INDEPENDENT PRACTITIONER. (*May, NEW YORK.*)

"SOME THOUGHTS UPON EROSION," by Dr. Edgar D. Swain. In a recent conversation with Prof. Black, he said:—"I do not consider Erosion a species of caries, as some have suggested, but

do believe it to be the result of abnormal secretions, from glands situated in the lips and tongue, at the points of contact with the teeth." The lips touch most forcibly the highest point of the convexed surface of the teeth, leaving above that point of contact a pocket. The glands of the lip at point of contact may become closed, and consequently a low condition of inflammation exist, causing abnormal secretions. This, however, will not account for the disease upon the lingual surface of the superior incisors, and I have never yet seen a case of Erosion upon the lingual surface of the inferior incisors.

Erosion is probably a result of combined conditions, and we are not justified in attributing all cases to any one apparent cause. The study of this disease opens up a large field for observation, which should be developed by the young men of our profession, and followed to a successful termination.

I have consumed much space in telling what I do not know, but hope others will continue the investigations until, like "*Pyorrhœa Alveolaris*," we shall be able to successfully arrest its ravages.

"A VISIT TO FOREIGN DENTAL SCHOOLS, and other observations," by Dr. Harlan. The writer remarks upon and criticises what he saw of the Dental World in London.

"AQUA CALCIS," by George J. Friedrichs, M.D., D.D.S. After many years of experiment and discussion, quite contrary views to those announced now obtain with the best minds of the profession, and it is pretty generally accepted as an ascertained fact that neither diet nor geographical location has anything whatever to do with the formation of the teeth.

I know of no remedy that is more efficacious in neutralizing the acidity of the fluids of the mouth. It is an excellent astringent in flaccidity and sponginess of the gums, preventing putrefaction, and by its mild stimulation inducing a healthy reaction of the general tissues of the oral cavity, in this manner removing the external causes of caries, and thus preventing the progress of decay of the teeth.

If the theory advanced that, on account of the geological formation that environs New Orleans, the inhabitants thereof are deprived of a sufficiency of lime-salts, because they are confined to cistern water for potable purposes which contains no lime, rachitis ought to be more prevalent here than it is; yet, in my

professional experience of thirty-six years, but one case of rachitis has come under my observation.

In conclusion, I think it can be safely asserted, judging from all the lights we have before us, that the administration of aqua-calcis as an effective agent in supplying the necessary rehabilitating elements has been weighed in the balance and found wanting; and, as the natural deduction, that New Orleans is more liable, on account of its peculiar environment, to the production of "softened and decalcified" teeth than is the case elsewhere, is a palpable fallacy.

"DENTAL CHEMISTRY," by S. B. Palmer, M.D.S. This was the subject of a paper read before the Fifth District Dental Society of the State of New York, in which the writer deals with the A B C of chemistry in the hope of encouraging private study and helping such as would gladly seek a practical knowledge of the subject.

In the report of the annual meeting of the Louisiana State Dental Society, there is an abstract of a paper on "URÆMIA, AND ITS EFFECTS UPON THE TEETH," by Dr. W. J. Reese. The effect of uric acid in the blood, upon the teeth, is a *phagedæna pericementi*—an eating away or absorption of the peridental membrane. Pyorrhœa alveolaris is a misnomer; uric acid produces violent inflammation and intense pain, but rarely suppuration, except in contact with the fluids of the mouth, and not always even then. At the roots of the teeth, where protected from the air and the saliva not in contact, there is no suppuration. There is sometimes a bony deposit instead of absorption, and sometimes both of these conditions may exist about the same tooth, as in the superior molars, where, on the palatine root, the gum and alveolus will often be absorbed without suppuration, while the labial root will be erostosed, though apparently otherwise healthy, especially if it has no antagonist. The formation of tophus on the roots of the teeth is a concomitant of uric acid trouble, though not necessarily so. When present, absorption always precedes the deposit by from one-sixteenth to one-eighth of an inch. Sometimes the tophus of uric acid and deposits of salivary calculus—phosphate of lime—will be found on the same tooth, the latter being of a lighter color and more porous. Women, when irregular in menstruation, or during pregnancy and nursing, have, in addition

to the deposits, the gum festoons purple, and bleeding at the slightest touch, sometimes from the quantity of blood and lack of inflammation, constituting a form of vicarious menstruation.

PASS LIST.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

DURING the April sittings of the Examiners, the following gentlemen passed their First Professional Examination for the licence in Dental Surgery:—John Girdwood, Edinburgh; William John Fisk, Kilburn, London; and Charles Maclean Cunningham, Cambridge; and the following gentlemen passed their Final Examination and were admitted L.D.S.Edin.:—Edward Perey Rose, Leicester; and John Trude Fripp, London.

FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

At the April sittings of the Examiners the following candidates were admitted Licentiates in Dental Surgery:—Matthew H. Nisbet, Glasgow; John Spotswood and F. Dale, Sheffield.

MONTHLY STATEMENT of operations performed at the two Dental Hospitals in London, and at the Dental Hospital at Birmingham, from April 1st to April 30th, 1886:—

	National.	London.	Birmingham.
Number of Patients attended...	1,511	2,317	882
Extractions { Children under 14	409	457	718
Adults ...	536	844	
Under Nitrous Oxide	445	742	
Gold Stoppings ...	84	164	7
Other Stoppings ...	508	583	53
Advice and Scaling ...	329	128	—
Irregularities of the Teeth ...	227	103	—
Miscellaneous ...	138	98	145
Total ...	2,676	3,119	935

Editorial.

SIR JOHN TOMES, F.R.S.

THE honour of knighthood has been conferred upon Mr. John Tomes, F.R.S., F.R.C.S., L.D.S.Eng. This fitting recognition, long since merited, will meet with the hearty approval of the whole medical profession, and especially of the dental section of that great profession. Sir John Tomes is the father of scientific dentistry. No man living can be credited with having done so much for the dental profession—as a pioneer in original investigation; as a teacher of the present generation of dentists; in prevailing upon the Council of the Royal College of Surgeons of England to apply for, and to obtain, a charter in 1858, that they might grant the L.D.S. qualification; and as a worker for that State recognition (the Dentists' Act, 1878) which we value so highly. It is for those “eminent professional services rendered in the profession to which he belongs,” that this honour has been granted. Nowhere are those “eminent professional services” more recognised and appreciated than amongst the dentists themselves, whilst the effects and benefits of those “services” are manifest upon the public at large. This is the second instance of such a mark of royal recognition of a member of the dental profession. In accepting this distinction, Sir John Tomes does a still further service to the dental profession. The profession has on former occasions given expressions of gratitude for the valuable services Sir John has rendered in years past. Now again will the congratulation of the profession be unanimous, and the sentiment re-echoed that he may long live to enjoy this additional honour and grace our specialty.

GOSSIP.

MR. J. JAMES BAILEY, L.D.S.Edin., has been appointed Dental Surgeon to the Royal Surrey County Hospital, Guildford.

MR. WILLIAM ADOLPHUS MAGGS, L.R.C.P.Lond., M.R.C.S., L.S.A., L.D.S.Eng., has been appointed Dental Surgeon to the North-west London Hospital, *vice* Mr. F. Newland Pedley, F.R.C.S., L.D.S.Eng., resigned.

MR. R. DENISON PEDLEY, L.D.S., M.R.C.S., has been appointed Dental Surgeon to the Evelina Hospital for Sick Children, Southwark Bridge Road.

A DINNER, in aid of the National Dental Hospital, will be held at the Albion Tavern, Aldersgate Street, on the 29th inst. Sir Robert N. Fowler, Bart., M.P., will preside.

THE Annual Distribution of Prizes to the students of the National Dental College will take place at the Beethoven Rooms, on the 22nd inst. Sir William Mac Cormac will preside.

THE Annual Meeting of the British Dental Association will be held in London on the 19th, 20th and 21st of August, under the presidency of Sir Edwin Saunders.

THE following case of catalepsy in Cork Union Workhouse is recorded in the *Lancet*:—A man named O'Sullivan, fifty years of age, has been for over twelve months—viz., April 27th, 1885—in a deep sleep, except when awakened to partake of food. On the date above mentioned he was found by the constabulary fast asleep in the open air, and removed to the workhouse. When shaken roughly, he awakes and will do what he is told, and when food is placed before him he will take it, but he has to be shaken at intervals to prevent him going to sleep. When he has finished eating, he falls asleep in whatever posture he happens to be in at the time; if put in a standing position with his hands above his head, he remains in that posture until disturbed; and if placed on two chairs, his head resting on one and his feet on the other, he remains so, the body being quite stiff.

THE function of the tonsils is, Dr. Hingston Fox thinks, connected with the re-absorption of the surplus saliva, and it is suggested that these glands absorb the poisons of scarlet fever, diphtheria, &c., from the saliva. The poison of a common tonsillitis has little more than a local effect; that of a scarlatinal tonsillitis is able to reproduce itself in the system indefinitely without deterioration.

THE advertising dentist (says Dr. G. J. Friedrichs, President of the Louisiana State Dental Society) is not a contented man, for he publishes to the world that a generous public has not awarded him his due share of employment; he is not an upright man, for he disregards the ethics of his profession; he is an unprincipled man, for he tries to raise his own status by debasing the standing of his fellow-practitioners; he is an arrogant man, in his presumption placing himself above being taught; he is a conceited man, for he judges others by his own standard; he is a selfish man, his whole soul wrapped up in self; he is a dishonest man, for he promises results which he knows cannot be attained, and thus he procures money under false pretences.

THE Edinburgh Dental Students held their annual dinner on Friday, March 26th, Mr. Alexander Cormack presiding, and Mr. T. Stewart Durward acting as croupier. There were forty gentlemen present, amongst whom were—Dr. Symington, Mr. T. Falconer King, Mr. Macleod, Mr. Andrew Wilson, Mr. Briggs (of Glasgow), and Dr. Wilson. After the loyal toasts, the Chairman proposed “The Edinburgh Dental Students’ Society,” and Mr. T. Stewart Durward, the Vice-President, replied. Other toasts were—“Kindred Societies,” “The Dental Hospital,” “The Lecturers,” “The Chairman” and “The Secretary.” During the evening an excellent programme of music and recitations was gone through by the following students and others—Messrs. Monroe, Ezard, Page, Walker, Macdougall, Macfarlane, Leighton, Tait, and Sinclair.

THE British Dental Association continues to grow. The latest evidence of this is the fact of the recent formation of a Southern Counties Branch. Mr. Alderman Rymer, J.P., has been elected the first President.

THE *Scientific American* says, to make antique brass, dissolve 1 oz. sal ammoniac, 3 oz. cream of tartar, and 6 oz. common salt, in 1 pint hot water ; then add 2 oz. nitrate of copper, dissolve in a half pint water ; mix well, and apply it repeatedly to the article by means of a brush.

THE following Bill has been introduced in the New York Legislature: Section 1. A dentist who shall administer chloroform or ether to any person, unless said dentist shall be a regularly graduated physician from some legally incorporated school of medicine and surgery, is guilty of a misdemeanor. Section 2. This Act shall take effect on and after the first day of September, 1886.

To check profuse hæmorrhage after the extraction of teeth, Dr. W. J. Reese recommends the following procedure: Take a very soft wax impression of the parts—trim it out and fill with a soft batter of plaster and apply immediately, pressing down firmly until the plaster is set. This will succeed after all other methods have failed.

IN the Medical Acts Amendment Bill now before Parliament, it is proposed to repeal one of the sections of the Dentists' Act, so as to enable any private person to institute a prosecution under that Act.

DR. STOCKWELL, of Springfield, Mass., recommends the following method of treating and filling root canals at a single sitting. After opening into the pulp cavity immediately apply the peroxide of hydrogen either with cotton or with hypodermic syringe. Then clean out the cavity and canals as thoroughly as possible ; then inject the peroxide of hydrogen ; after giving it time to act, apply again and repeat as long as bubbles arise to the surface. When there is no further action from it, apply bichloride of mercury (one part in a thousand is strong enough), the object being to destroy the microbes. After applying this I proceed to fill the apex of the root with gutta-percha dipped in extract of eucalyptol and iodoform. In most severe cases I saturate a piece of cotton with this solution and load it with powdered iodoform, and force that up to the end of the root, the object being to have it as strongly antiseptic as is possible.

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THE RICHMOND CROWN.

By STEWART J. SPENCE, San Francisco.

IN searching the pages of a late copy of the DENTAL RECORD, which found its way to this western shore, I read an article on various methods of pivoting (p. 195), which seems to me to deal with none too much favour with a method of pivoting which deserves more consideration. I refer to the so-called Richmond crown.

Although this excellent method has lately had a good deal of advertising in the pages of the *Cosmos* and in the latest edition of Harris's "Practice and Principles," it has had no more than it deserves, and perhaps has not been brought sufficiently before the dental profession in Great Britain. I will, therefore, give a detailed account of the process as practised by myself for the last three years with unbounded satisfaction.

The chief, I may say the only, objection offered by Mr. Dougan in his otherwise excellent paper against the Richmond crown is "the objection of irritating the periosteum." I fancy this is more imaginary than real. I have never had a case of trouble from this source; and if it were a serious danger it would be found urged against the all-gold crown, which is certainly as liable to err at this point, but which has, nevertheless, marched triumphantly from conquering to conquer for over fifteen years—commencing its career from this sunset shore, and has reached the "crowning point" of dentistry. It is more than probable that the irritation of the periosteum is caused by the use of oxychloride of zinc, rather than the presence of the gold band; and this may be obviated by using the oxyphosphate.

Excellent methods of operation may fail and become disliked from inattention to small details in their performance. The method now advocated is not the easiest to perform, and under

favorable circumstances will occupy about four hours. The details are :—

A plaster model of the root is obtained by ligaturing a ribbon of copper around the root and taking an impression in wax, care being taken that the copper band is not sprung so that when removed from the root it will lose its shape by springing inwards, and thus delivering a smaller model of the root than should be.

Around this model of the root is bent a gold collar of twenty carat gold (a lower carat is liable to give a peculiar greenish shade to the part where it meets with the porcelain tooth); the ends are soldered together, and the cervical borders festooned, especial care being used to leave sufficient width of the gold band to pass under the gum at the palatal portion, where, as we all know, the gums do not so much embrace the crowns as at other portions. This band is now fitted on the root, its labial surface cut down to about $\frac{1}{2}$ inch, and the root at the same time ground down below the gum. The root canal having been prepared, a peg of wood is now driven into it, and the impression taken in wax. This wooden peg will remain in the root when the impression is withdrawn, and so will also the band probably remain around it; they should be removed and replaced in their impressions. That part of the peg left exposed from the root should be cone-shaped, not bell-shaped, so as to fit perfectly back into the wax. A model is taken, and the peg withdrawn from the plaster, showing the band in position, and the direction of the root canal. The band (which should have been oiled) is now gently removed, and a disc of platinum cut to fit it, by holding the band over a sheet of platinum, and with a sharp-pointed instrument run around the inside of the band marking the size of platinum needed for the cap. Replace the band on the model, and fit the platinum disc to its inner circumference, then unite band and disc with wax, remove and solder together. (If the operator deems it too much trouble to solder so often, he may dispense with all but one soldering, but he runs risks.)

A hole is next punched through the platinum cap, and a serrated bar of platino-iridium fitted to the root canal. It is not necessary that this bar should be now attached to the pin-heads, but it is necessary that it should project upwards some distance, so that the solder which will eventually be flowed to form the backing and bind together the several parts may have a sufficient grip upon it.

A plain gold or vulcanite plate tooth is now backed with platinum (there is a little danger of melting off gold in soldering), and ground at its labial edge to fit on the surface of the gold band. By grinding each on a flat-sided corundum wheel, the joint may be made very perfect. If at any point the tooth overlaps the gold, it may be ground off and polished, similarly with the gold, so that if the gold band shows in the mouth it resembles a gold filling. Bevel the tooth backwards below the pin-heads to some extent. The tooth is now cemented to the cap and pin by hard cement (half wax, half resin) and held in place while the cement is cooling, to prevent the drawing of the cement from separating the tooth from the band at its labio-cervical margin.

The whole may now be removed, and if need be, tried in the mouth; or otherwise, invested in plaster and marble dust. In doing this investing, be careful to work the inside of the cap full of the investient, else air is liable to be retained there, which may permit solder to flow through and occupy space inside the band, which will prevent it fitting the root until burred out. There is also danger of melting the band while soldering, if it has not been covered with a good thickness of investient.

After soldering and polishing, the tooth is tried on the root. If the band causes the slightest soreness when pressed down, it may be well to temporarily set the crown with wax for a few days, and then, if still sore, remove a portion of the lower edge of band. This edge should always be left smooth and bevelled, and, in fact, this always is done in polishing, especially if a brush wheel is used. The oxyphosphate used in setting the crown should be mixed quite thin, so that all surplus may squeeze out, which is not easy to do unless it is mixed thin; and unless it be done the gold band may become exposed and not grasp the root as intended.

Of this method it may be said in its favour that it is the strongest method of pivoting, that it is the least liable to permit decay of the root or to produce decay of the approximal teeth, that it gives a wide range for choice of tooth, and that experience has demonstrated that it is not liable to fracture, either of itself or the root, and should it come loose bodily it is easily replaced. I have not had nor know of one case of fracture in this method, and only three cases where the crown became loose and needed resetting.

THE PREPARATION OF THE MOUTH FOR AND THE INSERTION OF ARTIFICIAL TEETH.

Read before the Students' Society of the National Dental College.

By JOHN TRUDE FRIPP, L.D.S.Edin. & I.

MR. PRESIDENT AND GENTLEMEN,—The subject which I have chosen on which to invite discussion this evening is one which, in the view of some members of the profession, does not take very high rank in the scale of scientific subjects. There are some, I believe, who consider that the profession should be divided into two branches, one (the higher) the operative; the other (the lower) the mechanical.

I have heard, although I do not personally know it for a fact, that there are some practitioners who confine themselves entirely to operating, leaving the insertion of artificial teeth to other men.

Whatever may be the case in some comparatively few instances, there is no doubt that the vast majority of the men in our profession lay themselves out for general practice, or, to quote a phrase seen sometimes in advertisements, "Dentistry in all its branches."

Although it may seem very respectable and refined (especially from their own point of view) for a few men to speak of the operating room as the only sphere worthy of their presence and attention, yet the fact remains that, speaking generally, the man who is not a good mechanic will not be a good or successful dentist.

The powers that be, recognizing this fact, have in their wisdom required that the first part of the dental curriculum shall be a three years' apprenticeship to mechanical dentistry.

In no profession is the demand greater for versatility, for readiness of adaptation to any and every circumstance that may arise, than in our own. A man should be equally at home with the engine or the lathe, the forceps or the blowpipe, filling teeth or mounting them, conserving the mouth or supplying its deficiencies. The man who is not able to perform every detail of work, whether in surgery or workshop, for himself, will never be able, should he ever get the opportunity, to direct assistants in their work for him, or to decide whether the work is or is not properly performed. Such

a man would be scarcely likely either to make or maintain a successful practice.

Be a man ever so good an operator, yet if he have not the tact or skill to make a good fit or a suitable match, his reputation is likely to be of very slow growth and his connection correspondingly small; while a poor or indifferent operator (that is, in the matter of saving teeth) will, in many cases, if he be clever and skilful in the adaptation of artificial teeth, rapidly make a large and remunerative practice.

Mind, I am not saying that this should be the case, but simply recognising what I believe to be a well-known fact. I believe very thoroughly in conservative practice, but seeing that so great a demand exists for what the Americans call "Prosthetic Dentistry," a demand which is probably greater now than at any previous time, and which is constantly increasing, is there not room for very great improvement in this branch of our work, and should not greater and more intelligent care be bestowed upon it?

How many of the cases which come to us give the idea that the operator took the models and forthwith handed them to an assistant in the workshop, with few or no instructions, leaving him to "set up" the teeth according to the best of his ability, without any regard to the character of the mouth and face with which the new denture should harmonize? The case thus "mechanically" made is put into the mouth whether satisfactory or not, in a large number of instances decidedly *not*. Now this serious fault is committed not only by those from whom it might be expected, that is the advertising quacks, who may be supposed to make teeth by steam machinery, but many of those who hold good names and high places in the profession are guilty of inserting in the mouths of confiding patients work which I venture to say they would not care to meet again in the presence of their professional brethren.

The only excuse which can be urged is want of time, and this should be no excuse at all, since if a man have not time to do work properly himself or see that it is done properly by others he ought not to undertake it.

It is probable, however, that with most of us the danger of having too much work to do is a somewhat remote one, and if we do not our best to meet the requirements of each case entrusted to us we cannot shelter ourselves behind this flimsy excuse.

In my paper this evening I do not expect to advance anything new, and it will no doubt be found as the discussion proceeds that my own knowledge is sadly deficient in many respects. The fear of disclosing my own ignorance does not in any way deter me from introducing the subject, because my object is not to teach but to learn, and to elicit discussion which shall be mutually profitable. It is impossible for me to speak too highly of the advantage which I have personally derived from the meetings of our Society, and I am hoping that this evening I shall go home with a larger store of knowledge than I brought with me. To proceed now to the direct consideration of my subject, "The preparation of the mouth for and the insertion of artificial teeth."

A large number of the patients who consult us for the purpose of getting supplied with artificial teeth (perhaps I ought to say the *larger number*) are those who have greatly or entirely neglected the mouth in the past, and have simply allowed it to go to ruin. As the consideration of such a case will afford us the best means of dealing with our subject, I will take a supposititious one which will find its counterpart in actual every-day practice.

A patient presents himself, with a mouth in which half of the upper teeth are irretrievably lost. Two or three front teeth too bad to make a decent appearance if filled, or decayed away to the stumps. Some molars and bicuspid on both sides gone also, stumps remaining. In the lower jaw six front teeth probably in good condition, that is free from decay, but much covered with tartar; perhaps one or both bicuspid on either side also remaining; first molars have been extracted, second and third molar stumps still existing.

I think this is a fairly typical case. What shall we do with it?

The old plan, which I was taught, and which I regret to say, I practised in my early days, was to get, first, the nippers and stump file, and proceed to reduce all the ragged edges to the level of the gum—not to extract anything unless the patient was in actual pain. Models taken, the pieces were made, materials according to the means of the patient, but always held in by three or four wires or bands in the upper, two clasps in the lower. Simple, expeditious mode of treatment, no pain given, patient pleased, fee paid, operator satisfied. The sequel of such a case is well known.

Fairly comfortable for a time, but mouth never healthy, breath

unpleasant, the denture being only seldom (in some cases I have known by the advice of the dentist, never) removed, the patient finds after awhile that the supporting teeth are becoming sensitive, and that any effort to remove the plate produces great pain and discomfort. Besides this injury to the supporting teeth, the stumps also are often tender; a slight cold, or other derangement of health, giving rise to periostitis and gingivitis, and making the toleration of the teeth for a time almost impossible. On raising the lips we shall probably find a number of more or less active volcanoes in the shape of disgusting pus-discharging sinuses. Either the dentist is again consulted and a little patching done, or the patient waits in constant uneasiness until all the remaining teeth are lost, and then the work has to be commenced all over again. Either all the roots must be removed, or more likely a complete set made over them, to be kept in place by springs, and the roots left to be thrown off as nature can best manage that process.

This is the plan which used to be adopted, and which, I am sorry to say, is not discarded yet by many who ought to know better.

I cannot too emphatically say that such a course is to be most strongly condemned, unless the patient's health or some other urgent and imperative reason stand in the way of proper treatment. It should then only be undertaken after explanation or under protest.

Discarding this "old way," as I am sure we shall all be agreed to do, again we ask, "What shall we do with the case?" A great authority, Mr. Spence Bate, has recently said, in a paper on "Excision versus Extraction," read before the British Dental Association, that "neither stump nor tooth should be removed that is healthily implanted in its alveolus or could be made so." And then proceeds to an enumeration of some of the cases in which roots should or must be removed, all the healthy ones being treated and filled. We have the greatest respect for this most thorough conservative surgery, and it must be a great pleasure to a man to be able to restore to perfect health a mouth full of stumps, without putting his patient to the pain of a somewhat formidable operation.

But, I would ask, how often does it come within the range of possibility, or at least of practicability, to treat and fill a large number of stumps? Supposing the operator to be willing, the

patient would, I think, seldom be found who would be able or willing to give the required number of sittings, or pay an adequate fee for the time and labour employed.

Again, however good in theory, it seems to me to be bad in practice to remove here and there a diseased root and leave here and there a good or healthy one. The surface of the jaw is rendered very irregular, the yielding gum and the unyielding stumps alternating and making the comfortable fit of a denture much more difficult to obtain.

Of course where only upper front stumps are in question they should, if possible, be treated and pivoted. In such a case there could be, I think, but little difference of opinion.

There is yet another reason why, except for the purpose of pivoting or otherwise fixing artificial crowns, dead stumps should not be left in the mouth, and that is that they are so frequently exostosed, and give rise to more or less severe neuralgic pain and disturbance, the patient in many cases being entirely unaware of the cause of the pain, and in some cases I have known obstinately sceptical when the cause has been pointed out.

It will no doubt have already been gathered from the tone of my previous remarks what my own treatment would be of such a case as that instanced.

I should carefully look round the mouth, and a few minutes' inspection would enable me to decide what teeth should remain and what be removed. Having due regard to the position of the teeth and the antagonism of the jaws, all the sound teeth should be left, and also such teeth as can be made good by filling, and all tartar carefully removed. *All doubtful teeth*—and on this I would lay great emphasis—should be extracted, and also all the stumps. Many an otherwise satisfactory case has been to a great extent spoiled by leaving in the mouth one or more teeth which (it was thought) might be made good, but which did not prove amenable to treatment, and eventually had to be extracted, much to the chagrin of the operator and dissatisfaction of the patient.

I know that several objections may be urged against this mode of treatment. Some will say that the shock to the patient in a case of such extensive extraction will be too great. As a matter of actual practice I have found that generally a patient suffers little if any more shock or after-pain from the removal of a dozen than from the removal of three or four teeth.

Another great objection frequently urged is that there is so much difficulty in the length of time the patient must wait for the settling of the gums; a period of several months or a year. I put in a set of teeth some time ago for a woman who had all her teeth extracted at a Dental Hospital, and, acting on the advice there given her, had waited in a perfectly edentulous condition for twelve months. I also saw in the *Dental Cosmos* some time ago an advertisement of a practice for sale in which one of the points urged was "so many dollars' worth of work in hand" in the shape of mouths waiting until fit for the insertion of artificial teeth.

To the practice of keeping the patient waiting thus without teeth there are most serious objections. It is almost like condemning him to a slow starvation, for little if any solid food can be taken. The muscles of the mouth and face become so seriously contracted that the natural expression is greatly interfered with and can never be properly restored, and in many cases the contraction is so great that a set of the proper size cannot possibly be inserted.

A year or two ago I heard a conversation in the extraction room below between several gentlemen, one or two of whom were officers of the hospital. The subject was the difficulty of making an equitable arrangement in the charges for temporary and permanent sets of teeth. If a temporary set were inserted the patient did not expect to pay the full fee, and yet for any subsequent set they objected to the full fee, saying, "Mr. So-and-so had only charged *so much* for a set."

This is a difficulty which in actual practice I do not find to exist. For some years past I have ceased to talk about temporary sets as I do not believe them necessary.

My plan for a long time past has been to put the new case in from twelve to twenty-four hours after the extraction, or even less, explaining to the patient that perhaps at the end of a year a refit will be necessary; but as an actual fact it is very seldom required, the gums to a great extent shrinking and settling to the shape of the denture.

I will just instance a case which I had the opportunity of seeing during the last month. A lady from Yorkshire came to consult me about putting her mouth in order, and arranged to stay with her friends close by until I had finished. This was about two-and-a-half years ago. I administered the gas to her twice

each day for three successive days and removed twenty-six teeth. Within a few days I put in a new set, vulcanite upper, cheoplastic lower, telling her she would probably want them remodelled in a year's time. I saw her once or twice to relieve the set during the next week or two, and she then returned to the North. I heard from her friends again and again that she was very comfortable, and now at the end of two-and-a-half years she assures me they are more comfortable than ever, and she can speak and eat with the most perfect comfort. I should have said she came to see me because a good man in York City had told her he must keep her without teeth for three months.

Since adopting this plan I bought Mr. Oakley Coles' book on "Dental Mechanics," and there found to my great satisfaction that I was in most excellent company. If you will allow me I will give you a paragraph from his book *in extenso*.

He says, "The question how soon after extraction artificial teeth may be inserted is one of great perplexity if the operator be unguided by practical experience. Theoretically, one would consider that a considerable time should be allowed to elapse. From my own experience, practically, I consider twenty-four hours enough; that is, I have many times taken out ten or more teeth one day, and put in a full set of artificial teeth the next day, and I have found the least absorption, especially in comparatively young subjects, in those cases where the shortest time has elapsed between the operation and the insertion of a new denture. Beyond the advantage of ready treatment which this plan offers, there is the still greater benefit of preserving more completely the contour of the face. Many practitioners consider that a temporary set of teeth may be fitted in at the end of a fortnight or three weeks, and a permanent set at the expiration of twelve or eighteen months. I have found, however, that those dentures that I have fitted in immediately after operating have fulfilled every requirement of a permanent set, so that no further change has been necessary."

This exactly coincides with my own experience, but I must add to it a little fuller explanation of my own mode of practice.

The impression being taken immediately after the extractions, with composition as soft as possible, and kept in the mouth a good while to get hard enough to be withdrawn without "dragging" or "sucking," it is put into cold water and sent to

the workshop to be cast immediately. I then select the exact teeth for the case, and try them by putting them right up into the sockets, and I then know that those teeth will fit in without any grinding or fitting, going into the socket from an eighth to three-eighths of an inch. I am referring now specially to the six or eight front teeth, though in many cases the molars also may be put a considerable way into the sockets.

In a case which I have in hand while writing this paper I have removed all the back teeth on both sides in the upper first, leaving the six fronts until last, in order that the sockets may only be vacant one day.

When the model is cast it will be found that the sockets are well marked though not deep enough. Each socket must then be carefully deepened until the tooth will fit into the model as deeply as it did into the gum. When all the teeth are thus placed in position they may be waxed on to the model, and the palate being put in the piece will be ready for flasking and baking.

In cases where the bite is close, or where we desire to make a specially strong and good frame, flat teeth may be chosen and backed either with gold or dental alloy, and when fitted into their sockets a wire bent round so as to touch every tooth, the whole waxed together and carefully lifted off the model and invested in plaster and sand for soldering. By this plan an exceedingly light and strong case can be made.

In cases where only three or four teeth are required the plan I have described is exceedingly satisfactory. I will mention one which I did a week or two ago. I removed one central incisor and both anterior bicuspid at twelve o'clock, and at six put in the new teeth backed with dental alloy and strengthened with wire soldered to each tooth and the whole mounted on a vulcanite palate. Four days after, being on a visit to the patient's house, I examined the mouth, and found that on raising the lip it was impossible to tell which of the centrals was the new one, so perfectly had it fitted into the gum, and so exactly alike were the festoons of the gum over natural and artificial teeth.

One point it is very important to observe. *The teeth should always on first putting into the mouth be too long* by an eighth of an inch or so, as they sink into the gum considerably afterwards, say in the course of a day or two. Some cases which, when first put into the mouth, look as though indisposed to fit up in their places

I find to work up into the gums and fit as snugly as could be wished.

Where only a few teeth have been extracted and the mouth is not very ragged, gold or dental alloy plates may be used if desirable and with perfect success. I have with me a couple of models in which gold and dental alloy were used, and you will see where the sockets have been cut to receive the teeth.

Of course there will be a subsequent shrinkage of the gum, and the festoon of which I just spoken, will not in all cases be preserved; but if the tooth be inserted far enough into the socket the shrinkage can seldom or never be sufficient to allow the end of the tooth to project or catch the lip.

We are all familiar with the appearance of the mouth in which teeth have been inserted a few weeks after the extraction. The teeth being short, the gums have gone away from them entirely, and the denture may easily be removed by the action of the lip upon the projecting and uncovered teeth.

In the plan I have been advocating the teeth are of necessity brought further in at the necks, indeed exactly in the position of those they supersede.

Another important feature is that the pain to the patient is much less when the teeth are put into the sockets.

When once the sockets are closed the teeth must be put outside the gum, and any pressure at once pinches the gum between the alveoli and the new denture, giving rise to great pain, and often necessitating a further shortening of the teeth at the cervical end.

I have found that after the first few hours or a day the pain and tenderness have in most cases almost entirely passed away. In order that the perfect adaptation may be maintained I usually instruct patients not to allow the new case to be out of the mouth at all (except for cleaning after meals) for some weeks, until the gums have fairly settled, and after that to use their own discretion about wearing it at night.

In cases where the lower back teeth have been extracted I do sometimes think it better to wait for awhile, as the teeth cannot be put into the sockets as in the upper, but, as in the case I instanced just now, when it has been necessary to insert at once, the teeth usually fit very well.

I have generally recommended a mouth wash of Condyl's

fluid or permanganate of potash, until the gums have well healed.

I should like to say here that, notwithstanding the very extraordinary case which Mr. Spence Bate mentions in the paper from which I have already quoted, of a woman who went mad after the extraction of a number of teeth, I believe that it is very rare for any untoward results to follow that operation. I cannot call to mind any other that I have heard of, although many many times I have known patients to regret exceedingly that the stumps were *not* removed. I have never known a case during the nearly twenty years I have been connected with the profession of regret being expressed or any trouble ensuing after the removal. All my experience has been entirely the other way.

It will, no doubt, be felt by some that it must be somewhat inconvenient to be obliged to get the cases done so quickly, especially if several of them be in hand at once. It is inconvenient sometimes, but the result is worth the inconvenience and trouble. But if a judicious selection of teeth be made, there is so little fitting required that a case is very quickly got out of hand. I have in many instances cut the sockets in the model and put the teeth all in order in ten minutes or a quarter of an hour from the taking out of the models, and given to my assistant to wax up and vulcanize at once.

Mentioning the fact of putting the teeth in order reminds me of one thing which I had almost forgotten to say, it is this—If men undertake to supply artificial teeth they should either see to the arrangement of them themselves or get an intelligent assistant who can see the patient's mouth and receive instructions in the surgery and then arrange the teeth artistically. How seldom do we see Nature's irregularities copied, and how often do we see, much to our disgust, rows of teeth "set up" as regularly as the keys of a piano and the edges as even as if smoothed with a file?

So frequently teeth are put into the mouths of elderly patients as perfect as we could wish to see at the age of blushing sixteen.

The dépôts provide us now with a marvellous assortment of teeth ready to hand, such as we can scarcely wish or imagine to be surpassed; but the hand and eye and brain of the dentist are all needed to so arrange and adjust them that they may be life-like, instead of obviously artificial. "The height of art is to conceal art" is a motto which every dentist should remember.

A little chipping of the corners, roughing slightly the polished surface, staining if necessary, and many other little devices which will occur to the mind in practice, go a long way in making our work satisfactory to ourselves and pleasing to our patients.

DENTAL APPOINTMENTS.

By CHARLES F. FORSHAW, D.D.S., F.R.M.S.

I WAS much pleased to see in last month's number of the RECORD a paper on "Dental Appointments," by Mr. J. W. Fisk; and there has recently been a little correspondence on the same subject in one of our local papers.

The correspondence originated in a dentist taking objection to the number of dental appointments held by a firm of dental surgeons in the town, and in his first letter he makes use of the following sentence:—"One of two things is very evident: the actual working of these appointments must either be left to an assistant, perhaps an apprentice, or the firm must spend a good deal of time away from private practice. From the infirmary reports I am inclined to the former view, as I feel confident that if the dental surgeon attended personally he could save a large number of the fifty or sixty teeth extracted every week." I replied to this saying that I thought that statement arose from jealousy, as I knew for a fact that the dentist attended every week, and that as there were now only about eighteen teeth extracted weekly, owing to a charge of 3d. made to every patient requiring extraction, the dentist could not possibly save fifty or sixty, seeing that there were now only a quarter the number to save.

Now, Mr. Fisk says that at a large provident institution the dentistry consisted in the usual extraction of teeth, and was performed by the dispenser himself; and, further, he asks what must be the opinion of the medical staff when they see dentistry represented by such inefficient means? I will proceed to give my opinion on this statement. As every one knows, it is only during the last few years that dentistry has made such effectual progress, and in the future it cannot fail to make even more rapid strides towards perfection; still I do not like to hear a man, trained and educated for the dental profession like Mr. Fisk, say that because the dispenser performs the dentistry it must of necessity be inefficient.

One of the senior surgeons at our own infirmary at Bradford proposed that, as there was too much charity at the infirmary, a charge of 3d. per patient be made by the dispenser for tooth extraction; this was seconded by the medical staff, and passed by the Board of Management. My father for nearly twenty-five years has been senior dispenser to the Bradford Infirmary, during which time he must have extracted at least 100,000 teeth. Now, who can be more competent than he at tooth extraction, which, as Mr. Fisk says, constitutes generally the operations even that an honorary dental surgeon performs? Of course the dispenser to an hospital is not the dental surgeon to the hospital, yet I can prove that in fifty out of sixty hospitals to which there is an appointed dentist the dispenser performs far more dental operations (extractions mostly) than the dentist. Again, there will not, during the next twenty-five years, be one-sixth part the teeth extracted as in the past twenty-five years—1st, because the dental surgeon saves a large number of the teeth; 2ndly, because a larger number of people take more care of them; and 3rdly, when the dispenser extracts teeth he makes a small charge to the patient, who then may either let him operate or, for sake of double the fee, consult a dental surgeon, who, if he at all understands his profession, will save all the teeth that he possibly can, and henceforth there will not be such wholesale extraction. I am speaking mostly, of course, of the practice at the Bradford Infirmary, rather than of a regular thing; still I think it will hold good for most large towns. The number of teeth that have been extracted in former years has been sadly too large. There was then no help for it, but now it is different. Mr. Fisk contends that the practice of appointing only one dentist to large institutions is bad. Nobody condemns and deplors this general practice more than myself, and, as he says, the result is that dentistry degenerates into tooth-pulling. Unfortunately, this state of things exists everywhere, and it will be long before it is remedied, and can only be thoroughly effected by having in each large town a dental hospital, on whose staff is a large and well-qualified body of dental surgeons.

Now, the principal reason of my writing this paper is that there seems to me to be a desire on the part of a great many persons to depreciate dispensers as a body, and, whenever they have the chance, to run them down. Now, I am not championing dispensers performing dentistry; still, as a general rule, they are appointed by

the management, on the recommendation of the medical staff, to do both dispensing and tooth extraction. What I rather objected to in Mr. Fisk's excellent paper was his saying—"What must be the opinion of the medical staff connected with that institution when they see dentistry represented by such inefficient means?" I should say that since the dispenser and dentist was appointed under their approval, they must have thought him competent. Personally, I learnt more during the sixteen months I was dispensing at the Eye and Ear Hospital than I should have done in ten years' ordinary practice. Most dentists know that it is customary for the physicians and surgeons of every large public hospital to make notes on the patient's prescription paper as to the origin, cause, and progress of their patient's complaint. As dentist to the hospital I should not have had opportunities of even seeing the papers, but as dispenser I had every chance of studying them thoroughly, and in the majority of cases I found that the diseases of the eye and ear were brought about by a neglected state of the teeth.

I should strongly advise any youth intending qualifying for the dental profession to have his three years' pupilage as short as possible, and during his spare hours to study pharmacy. My reasons are—1st, that a knowledge of pharmacy is now essential for a dentist; 2nd, that on his completing his apprenticeship he will have a chance of getting appointed to an infirmary as assistant dispenser, where he will have abundant opportunity of performing dental operations and helping to save the teeth, besides getting a thorough knowledge of pharmacy; and 3rd, if he is so fortunate as to obtain a dispenser's appointment, he will become intimate with the surgeons, and when he starts practice their friendship (speaking personally) will help to lead him safely up the ladder of success.

TONSILLARY CALCULI.

DR. CHARLES MARRIOTT, of Leamington, writes the following note to the *Lancet*:—

So rare is this affection, and so unusual the occurrence of two fairly large calculi being deposited in one tonsil, that it may be deemed of sufficient interest to be placed before your readers.

Recently Mrs. C—— consulted me with reference to an inflamed throat, with some slight difficulty in swallowing, and which

had existed, more or less, for some months. The patient had occasionally sought advice, but had obtained only temporary relief. The mouth could be freely opened, and the tonsils well exposed by depressing the tongue and drawing back the cheeks by an elastic retractor. The right tonsil was seen projecting conically inwards behind the uvula, having a yellow speck on its apex. To the touch this was hard, and grated under the probe. While thus exploring it a violent spasmodic effort, partly coughing and partly vomiting, came on, forcibly expelling a calculus the size of a large horse-bean, the relief being immediate. However, a few day later the patient called again, saying there was another calculus. The tonsil looked red and felt hard. On passing a probe into the sulcus left by the previous calculus I came upon something hard. Slitting up the tonsil and manipulating with a bent probe and blunt hook, I was enabled after some little difficulty to extricate another calculus, larger than the previous one, round, but very nodular, and in appearance very much like a vesical mulberry calculus. It weighed nearly a drachm, and its composition was chiefly phosphatic.

The peculiarities of this case appear to be its rarity and the existence of two large bodies in one tonsil causing so little inconvenience in a part ordinarily so sensitive. Though some authorities look upon calculi as the resolution of some tuberculous deposits, in this case all physical and constitutional symptoms were perfectly healthy, while the family history was exceptionally good; nor could I trace that the patient had suffered from follicular catarrh, thereby causing vitiation of the ordinary tonsillar secretion. The only solution I can give is that the crypts or follicles were unusually patent, allowing the accumulation of the buccal or salivary mucus, from which a gradual deposit was thrown down, while the treatment could be no other than that followed by me.

NATIONAL DENTAL COLLEGE.

THE Annual Distribution of Prizes to the Students at the National Dental College took place at the Beethoven Rooms on the evening of the 22nd ult., Sir WILLIAM MAC CORMAC presiding.

The DEAN read the following report:—

The year's work at our school has been fairly satisfactory, the attention and attendance of the pupils having been good.

During the year four Students have taken the Dental Diploma, whilst twenty-two are now prosecuting their studies.

Fourteen prizes have been won by nine competitors.

The Rymer Gold Medal for General Proficiency has been awarded to Mr. Albert Jones, as well as the Prize Medal in Dental Anatomy, and the Certificate of Honour in Operative Dental Surgery. It is worthy of special mention that Mr. Jones has thus distinguished himself during his first year. Mr. Lovitt is to receive the Prize Medal in Dental Surgery, and Mr. Timms the Certificate of Honour, as well as the Certificate of Honour for Dental Mechanics. The much-coveted Prize Medal for Operative Dental Surgery has been awarded to Mr. E. C. Fisk, after a very close competition with Mr. Jones and others; Mr. Fisk also takes the Prize Medal for Dental Mechanics. The Prize for Dental Materia Medica is to be given to Mr. Lankester, and the Certificate of Honour to Mr. Lombardi. Mr. Phillips has been awarded the Prize for the best piece of Mechanical Work. Mr. James Rymer is to receive the Certificate of Honour for Dental Anatomy and for Histology. The Prize of the President of the Students' Society for the best paper read before the Society has been gained by Mr. Pattinson.

The somewhat sudden death, last November, of our Lecturer on Metallurgy, Mr. Alfred Tribe, was a source of grief to us. Mr. Tribe had been for many years associated not only with our present School but also with the old Metropolitan School of Dental Science. The vacancy thus caused has not yet been filled up.

Mr. Oakley Coles, who for two years, up to 1879, held the office of Dean, has given up the dental profession in order to prepare for the Church. In recognition of the valuable services rendered to this institution his late colleagues and pupils presented him, through Mr. Rymer, with a silver inkstand and pair of candlesticks.

It is hoped that as a result of the Dinner to be held next week in aid of the funds of the Hospital, that means will be obtained to enable us to carry out the necessary enlargement, improvements, and conveniences which are so urgently required at the Hospital.

One recent event deserves notice. The honour of knighthood has been conferred upon Mr. John Tomes, F.R.S., F.R.C.S., L.D.S.Eng. This fitting and long-since-merited recognition of

“ eminent professional services rendered in the profession to which he belongs ” will receive the hearty approval of the whole medical profession, and especially of the dental section of that great profession. It is meet that devotion and labour should be recognised and rewarded. Of Sir Edwin Saunders and Sir John Tomes the Dental Profession has reason to be proud, just as the medical world appreciated the services and the royal recognition of our distinguished chairman of this evening—Sir William Mac Cormac.

The prizes and certificates of honour having been presented, Sir WILLIAM MAC CORMAC said :—

LADIES AND GENTLEMEN,—I have first to thank you very sincerely for the privilege you have accorded me in asking me to take the chair this evening, and to convey to the successful students the visible tokens of their success.

I have also to more especially thank your Dean for the kind allusions he has made to myself, and the flattering reception you have made in response to it.

In the report which has been read by the Dean, he says what must be regarded as most gratifying—namely, that the general work done by the students throughout the year has been satisfactory. This I would dwell upon, because it is really more important as evidence of the prosperity of the Hospital School than the mere fact that so many gentlemen appear by name on the list of prize winners. It is not for everyone to command a prize, but each one of you can do better : you may deserve one. Not that I would depreciate the value of the effort made by the nine gentlemen who have obtained prizes—I am sure their efforts and ability entitle them to it—but, while giving them all praise, we must not forget those who, having honestly tried to win, have, nevertheless, failed.

Gentlemen, dental surgery is now a very different thing to what it was when I was a student. We were then taught little or nothing about teeth, and considered the subject quite beneath our attention. I believe I never even attempted the surgical operation of drawing a tooth in my student days. Now all is changed, and an adequate knowledge is required at the hands of all surgeons of the anatomy and pathology of the teeth. Indeed, the connection receives the best sanction from the fact that a good dentist will be much the better for being a good general

surgeon as well; and that the larger knowledge, if first gained, is the best possible preparation for the adequate fulfilment of the duties belonging to the lesser speciality. Sir John Tomes, as well as many others, may be cited as an illustration of what I would urge. His eminent scientific merits have long since earned for him the high esteem and regard of all his professional brethren, and the royal honour recently bestowed upon him is a well-merited recognition, and will be well and worthily borne.

An adequate dental knowledge seems, to judge by your Dean's report, as well as by the prize list, to be no small matter: the modern dentist must know dental anatomy, dental physiology, dental histology, dental pathology, dental mechanics, dental materia medica, dental metallurgy, dental operations, and I know not what besides, before he obtains his dental diploma. Then I suppose he becomes D.D.,—an expression which may be regarded as either sacred or profane.

And here I might perhaps ask for a little information, which I to-day found it difficult to obtain. I wished to describe the position of the dental foramen in the lower jaw. Now the position of this foramen exactly corresponds to the posterior bicuspid tooth in the lower jaw. But what I wanted to know, and still wish to know, is whether this is properly called the first or second bicuspid tooth? I have seen it spoken of in books under both names, and, curiously enough, in three standard treatises on anatomy which I consulted to-day for the purpose of finding for which teeth the terms first and second are employed, in none of those could I find it, so that I am still at a loss to know which is the first and which is the second bicuspid tooth. I am sorry, gentlemen, to have to confess myself so very ignorant, but I cannot refrain from seizing this admirable opportunity of having the question settled for me.

As an ordinary and not a dental surgeon, I have not, of course, very much to do with teeth, unless, indeed, when they occasionally behave in an erratic manner. Two recent examples of this I might for a moment refer to. One is a case brought forward at your Odontological Society, and as it might possibly occur to one of you, I may mention it again. A skilful dentist was in the act of removing some old stumps from the mouth of a young woman, when the blade of his forceps broke short off, and the

patient at the same moment making a strong inhalation, the piece of metal was unfortunately sucked into the trachea; there it remained fixed for seven weeks, when the patient was brought up to town from the country, and after performing tracheotomy I was fortunately able to get the broken blade out with a pair of forceps. The moral of this is to use the best instruments; to apply adequate tests to them before use. In this particular instance the name of the maker was the very best, but the fact that the forceps broke made many think it could not be really of his making.

The other case was also that of a young woman who, during an epileptic fit, swallowed a large irregular tooth plate with four incisor teeth fixed in it. It lodged in the gullet and could not be extracted by the mouth, so I had to cut down upon it in the neck and remove it. This plate had been long in use, and its fixtures were no doubt much the worse for wear. Both these patients made very rapid and satisfactory recoveries.

They illustrate what serious accidents may befall anyone in connection with the teeth.

Ladies and gentlemen, I have only, in conclusion, to thank you for your patience in listening to me; to congratulate once again those who have won, to sympathise with those who have lost—not lost, however, but gained, in that they have made the effort to win—and to say how much pleasure it has given me to be here to-night.

Mr. Alderman S. LEE RYMER tendered the thanks of the Executive to Sir William for his kindness in presiding, and said the words of praise and encouragement given to the students would undoubtedly be a stimulus to further efforts, and the prizes given away that evening would, no doubt, to the recipients have a peculiar interest attached to them, from their having been received from such distinguished hands.

Mr. FELIX WEISS, in seconding the proposition, said it had been his happy privilege to watch their School from its commencement, and could therefore bear testimony to the admirable efficiency of its teaching, and more fully to the high character of the practice of the Hospital. Dr. Elliott, in presenting his prize-man, had alluded to the severe character of the examination in operative dental surgery, and he (Mr. Weiss) felt confident that

the work which was carried out would be creditable to any institution in the civilized world.

Sir WILLIAM MAC CORMAC having replied, an excellent programme of vocal and instrumental music was carried out, under the direction of Mr. Selwyn Graham.

THE ODONTOLOGICAL SOCIETY.

THE Ordinary Monthly Meeting was held on June 7th, Mr. GEORGE GREGSON, M.R.C.S., Vice-President, in the chair.

The CURATOR reported the gift of a model from Mr. Andrew Wilson, Edinburgh, showing three bicuspidis on each side of the lower jaw. There was also a supernumerary tooth external to the bicuspidis on each side of the upper jaw, but unfortunately a model of the upper jaw was not obtainable. The history of the case was rather interesting; both the first permanent molars having to be removed, their places were soon after occupied by a supernumerary bicuspid. The extracted molars were large, and had well-developed roots.

Dr. ST. G. ELLIOTT showed several forms of Bunsen burners; the first peculiar on account of its shortness; another, with the tube nearly horizontal, and which he described as an excellent form of burner for waxing up; a third was a compound burner which could be used for heating water in the ordinary way, or it could be used for a blow-pipe flame. Dr. Elliott also showed some new nerve drills in three sizes instead of one, as usual; the principal peculiarity was the pointing, which was triangular and corrugated. In concluding his remarks, Dr. Elliott invited the members to his surgery to see the Otto gas engine which he uses to drive the dental engine; the gas engine, being in another part of the house, was connected with the dental engine by means of bands passing underneath the flooring. He had also made the application of the Otto to the electric light, but this had not been altogether successful, owing to the oscillations. The cost of running the dental motor was a farthing an hour. He also showed two cables, one an ordinary S. S. White's cable and the other the spiral spring cable invented by himself.

Mr. BRUNTON, of Leeds, showed an adaptation of the dental engine which would be useful to those who suffered from "dentist's leg," being workable with either foot while setting. It is an exten-

sion of the S. S. White and Bonwill engine. The arm is a little longer than usual.

Mr. Brunton also showed a syringe for injecting cocaine for molars and bicuspid, both the needle and fitting being removable from the syringe. He advocated the use of the benzoate salt of cocaine as being a "perfectly stable solution." He exhibited, too, a new clamp and matrix. The clamp is made in the form of a parallel vice, and the matrix he claimed to be stronger than usual. Mr. Brunton also showed the first clamp he made in 1871, and claimed that it was identical with the clamp illustrated in the last number of the *Cosmos* as a new thing.

In reply to Mr. Walter Coffin, Mr. Brunton said that two and a-half grains had been injected without distressing effects following; and in one exceptional case, in which the patient was a dipsomaniac, as much as nine grains had been administered, the system appearing to resist the action of the cocaine.

Mr. W. E. HARDING showed a rather interesting pathological specimen of calcified crowns of a bicuspid and molar in the upper jaw. The patient, a boy a little short of six, came to him with these teeth suppurating and quite loose. The medical man had extracted the deciduous predecessor of the bicuspid nine months previously, and twelve months previously to that there had been a chronic abscess. This, he thought, showed the advisability of removing deciduous teeth which are causing chronic alveolar abscess.

Mr. HUNT showed models before and after treatment of the mouth of a healthy, well-developed lad of sixteen, having two very abnormal central incisors. Mr. Hunt was unable to apprehend what they were, and decided to wait their further development. Meanwhile a medical man removed one of the incisors, which had become carious, and a very few months after a very good central incisor developed itself. About twelve months after that the boy came under Mr. Hunt's observation again, and he removed the other incisor, first taking a model of the mouth. He now exhibited the models for the purpose of eliciting information.

With regard to cocaine, he had used it largely, but had never had occasion to use more than one and a-half grains. He might say, having had some considerable experience in mouth injection, that the mouth is very difficult to inject thoroughly; the solution may run down a fistula which, perhaps, will lead right away from the

point where anæsthesia is wanted, or from other causes you do not get anæsthesia at the exact spot at which it is required. His practice was to inject deeply and drive the piston down slowly, keeping the nozzle in the wound until he saw absorption taking place. If the syringe is taken out at once, a large portion of the injection will be found to have run out. In nearly all cases, one grain is sufficient for all purposes, and if injected in a proper manner, satisfactory and definite results will invariably be obtained.

Mr. J. B. BRIDGMAN sent a geminated lateral and upper supernumerary tooth removed from a boy aged eight; and Mr. TOD a specimen of osseous union of two molar teeth.

Professor GROVES, of King's College, London, read a paper on "Practical Microscopy," which he had intended illustrating with a series of views, but was prevented by the non-arrival of the bottle of oxygen. He regretted the absence, through illness, of the President, who was himself so experienced and took so great an interest in the subject. Mr. Groves then proceeded very exhaustively to treat of the successive stages of fixing, cutting sections, staining, and mounting; giving valuable information as to the best materials to be used, and carefully weighing their relative advantages and disadvantages.

The first thing to be done is to fix the specimen so as to keep all the tissues and cells as far as possible in their natural condition; for this purpose it is necessary to decalcify them. A fixing agent most commonly employed is osmic acid, a quarter to one per cent.; it does not penetrate very deeply, and it is therefore necessary to use comparatively thin slices. A more ready way of using osmic acid is to do so with chromic acid in the proportion of .10 osmic acid, .25 chromic acid, and water one hundred parts. Another fixing agent is picric acid; it is only said in books to be a splendid *hardening* agent—he did not find it so—but it is a splendid *fixing* agent. Silver nitrate has the further property of staining tissues. Chromic acid is extremely good with stem tissues for fixing itself perfectly; it is preferable to use it in one-sixth strength in spirit instead of water. Other fixing agents are vitriol and picric acid.

Passing to the hardening agents, the first on the list is alcohol, not because it is the best, but because it is always best to proceed to harden with a fixing agent. It should be used in a weak

solution, about one-half alcohol and one-half water, and gradually strengthened. Chromic acid is a very good hardening agent, but the danger is that it is generally used too strong. It should never be used stronger than one-eighth to one-quarter per cent. Bichromate of potash, two per cent., is a good hardening agent, so also is "Müller's fluid."

Among softening agents is a mixture which will not do for tooth specimens—viz., picro-nitric acid and water. By far the best for teeth is nitric acid one-half per cent., chromic acid one-quarter per cent., to water one hundred parts.

In describing the process of cutting sections, the most ordinary process being to freeze the material, Mr. Groves showed and described several beautiful instruments for that purpose. He then mentioned some of the fluids in which to keep the sections after they are cut, one of them being alcohol two-thirds to one-third water; another, glycerine, one per cent. solution of bichromate of potash; a third, a mixture of gum arabic and syrup with one-fifth per cent. of bichloride of mercury.

Proceeding to the staining stage, he had already enumerated some of the most useful. Logwood is the first on the list, and can be prepared so as to be certain of working perfectly. The way to prepare the extract is to dissolve it up in absolute alcohol; add a few drops of this to a saturated solution of potash alum, and when mixed add a few crystals of phenol. This will give a sort of brownish purple stain. Another very useful stain is borax and carmine; it will penetrate deeply into the teeth, and after some days it will be found that the whole mass is stained, and you need not trouble to stain after the sections are cut. The preparation consists of one-half drachm carmine and two drachms borax, dissolved in distilled water. Aniline dyes form most useful stains; with these all sorts of shades may be brought out. Another useful stain is osmic acid. The real use of osmic acid is to bring out any fat. Silver nitrate stains only certain tissues, being the cement substances, whether between cells or inter-fibrile substances. Chloride of gold (Mr. Groves said) had already been so fully and ably treated of by Mr. A. Underwood that he (Mr. Groves) would not touch upon it.

Having stained the specimen, the next step is to wash it, dehydrate it, and clear it. Clearing means removing all those substances which are of a lower specific gravity than the specimen

is going to be mounted in. The clearing agents are oil of cloves, oil of cedar, oil of bergamot, and oil of sandal wood. Oil of cloves is by far the most commonly employed clearing agent. If anilines have been used, oil of cloves must not be used, oil of cedar being the best agent in these circumstances. Turpentine and creosote, and turpentine and phenol, are useful for ordinary purposes; but if you are using a watch-glass, this preparation has a knack of creeping up the glass. Absolute alcohol is generally only used in conjunction with Canada balsam. Oil of bergamot does not dissolve celloidin.

Having cleared the specimen, the next step is to mount it. For this purpose Canada balsam is, perhaps, the medium most often used. It does for all dry, hard specimens. For mounting decalcified specimens the balsam must be dissolved in chloroform, benzol, or xylol—the latter is specially suitable if the specimen has been stained with an aniline dye. Next to Canada balsam, glycerine is most useful, or glycerine jelly. In some cases a mixture known as Farrant's medium, composed of two parts glycerine, four of water and one-half of gum arabic, is preferable. Mr. Groves showed how the section should be floated on to the glass slide, the excess of fluid removed with blotting paper, and covering glass applied. The latter had then to be secured and evaporation prevented by the application of some varnish round the margin, such as dammar varnish, solution of balsam in benzol, Hollis's glue (for specimens which are intended to be used with immersion lenses), Miller's rubber cement, and some others. The slide had then only to be labelled.

Lastly, Mr. Groves showed and explained the action of some of the best forms of microtome, including Pritchard's, Ranvier's, Rutherford's, and Williams', the substance to be cut being sometimes frozen either by means of ether or in salt, or else embedded in a mixture of paraffine and lard, or paraffine and vaseline, or in celloidin. In conclusion, he referred those who wished to obtain further information to a work by Mr. Bowles Lee, "The Microscopist's Vade Mecum."

After some discussion, the meeting adjourned till the first Monday in November.

GENERAL MEDICAL COUNCIL.

THE Thirty-ninth Session of the General Medical Council was opened on June 1st, and lasted nine days.

The business relating to the Dental Profession included the formal removal from the "Dentists' Register" of the name of Henry Francis Partridge.

The following communication was addressed to the General Medical Council:—

"Royal College of Surgeons in Ireland,

"Dublin, July 22, 1885.

"DEAR SIR,—Referring to your note of July 21, I am to inform you that the President and Council of this College have withdrawn the Diploma of Mr. H. F. Partridge, because of his having, in violation of his undertaking given to the College, resorted to advertising in connection with the Ladies' Dental Institution, South Kensington.

"A. H. JACOBS, Secretary of Council."

It was then decided—That the qualification of Licentiate in Dental Surgery of the Royal College of Surgeons in Ireland, appended to the name of Henry Francis Partridge, be erased from the "Dentists' Register"; That the name of the said Henry Francis Partridge be also erased from the "Dentists' Register."

The Registrar was directed to erase the name and qualification accordingly.

On the application of the Hon. Secretary of the British Dental Association, permission was given to Mr. Walter Read Galloway to prosecute W. E. Arnemann, of 6, Alfred Street, Mitchell Street, Radford, and A. Friedrik, of 5, East Avenue, Walthamstow, for alleged infringements of the Dentists' Act, 1878.

The following communication from the Registrar-General of New Zealand was received and entered in the Minutes:—

Erasures from "Dentists' Register," N.Z., to 31st December, 1885.

"Sinclair, Louis, registered as Lic. Dental Surg. Roy. Coll. Surg. Ireland, 1882.

"Name erased from Register in pursuance of sec. 5, Dentists' Act Amendment Act, 1881. 9th December, 1884."

The Diploma presented was dated 19th June, 1882. It was found afterwards that no Diploma was ever issued in the name of Louis Sinclair, but on the above date one was issued in the name of Louis Sinclair *Schlesinger*.

"I certify that the foregoing is the only name erased from the 'Dentists' Register' of New Zealand, under the provisions of sec. 5 of the Dentists' Act Amendment Act, 1881.

"Registrar-General's Office,
"Wellington, 4th Feb., 1886.

"WM. B. T. BROWN,
"Registrar-General, N.Z."

The preliminary examination was the subject of considerable discussion. In the end the following resolution, passed by the Council in Committee, was received, entered in the Minutes, and adopted:—

"That examination in the subject of elementary mechanics of solids and fluids, comprising the elements of statics, dynamics and hydrostatics, should be required in the preliminary examination, and should be passed before registration in the 'Students' Register'; but in Universities with a prolonged curriculum, where the examination in mechanics required for their degree is taken at a more advanced period of study than before commencing medical education, the registration may be effected on having passed the examination in mechanics, and it shall be the duty of the Registrar to antedate the entry to the period at which the preliminary was passed."

The following table shows the results of professional examinations held in 1885 for qualifications granted under the Dentists' Act:—

DIPLOMAS.	NATURE OF EXAMINATION.	With Curriculum.		Without Curriculum		Total.	
		Rejected	Passed	Rejected	Passed	Rejected	Passed
L.D.S. Eng. ...	Written, Oral and Practical.	4	26	0	0	4	26
L.D.S. Edin. ...	Written and Oral ...	0	7	1	3	1	10
L.D.S. Glasgow	Written, Oral and Practical.	2	2	4	4	6	6
L.D.S. Ireland .	Written, Oral and Practical.	0	1	4	7	4	8
D.M.D. Harv...	Written and Practical	7	8	0	0	7	8
D.D.S. Mich....	Written, Oral and Practical.	(Return not received).					

CHRONIC PTYALORRHŒA OF THE GLANDS OF THE ORAL MUCOSA.

By WM. HERBERT ROLLINS.

WRITING in the *Boston Medical and Surgical Journal*, on Recent Progress in Dental Surgery, the author says:—This disease has not been clearly recognised, though to the effects which it produces upon the teeth several names have been given, beginning with John Hunter, who mistook one of its symptoms for a distinct disease to which he gave the name “decay by denudation.” This name is still in use, and other and more recent writers have farther withdrawn attention from the real disease by giving the names “surface wear,” “erosion,” “denuding,” “chemical abrasion,” to its effects upon the teeth.

The only treatment which the writers who have used these names have suggested has been either to do nothing, or, when the effects upon the teeth have been extensive, to fill the cavities with gold.

Ptyalorrhœa shows itself chiefly in an increase in the amount of the secretion of the acinous glands of the lips and cheeks. Accompanying this increase in amount is an increased viscosity and slight acidity. Even in those cases where the effect upon the teeth is very rapid there is seldom a marked acid reaction in the secretion. This faint acidity explains why the grooves in the teeth almost always are smooth, as if polished; indeed, many writers mistaking the real cause of the trouble, have attributed the grooving of the teeth to the effects of a stiff brush in cleaning them.

There are cases where caries supplements ptyalorrhœa, in which the starting point of the caries is due to the intensity of the ptyalorrhœa, the evidently softened tooth substance not being removed as rapidly as formed; thus affording a culture ground for germs which produce the usual results, caries. These cases are chiefly those of the channeled form, in which the effects upon the teeth consist of grooves across the teeth near the necks.

Ptyalorrhœa is an entirely distinct disease from caries. In most cases it is a local expression of some ill-defined constitutional condition or conditions. In a less number of cases it is sharply local. Its effects upon the teeth show themselves in at least three forms: in a general wasting away of the teeth; in transverse channeling of the teeth at their necks; by the formation of saucer-

shaped cavities upon the labial surfaces of the teeth. This last form attacks the canine teeth often before any others. This fact, together with another, that pulpless teeth are as much affected as those having living pulps, tend to show that the effects upon the teeth are not due, as has been suggested, to a retrograde metamorphosis in which the wasting of the teeth is produced by an absorption of the lime salts by a new cellular growth. In one of these cases there is no living tissue from which the cells could come, while on the other hand it is not likely that if this were the true explanation the canine tooth, which is the strongest tooth, would be attacked first. In the cases in which the cupped or saucer-shaped cavities are formed on prominent portions of the labial surfaces, it is often easy to see the effect of the glandular congestion; the orifices on the mucous membrane occupying the centres of little raised papillæ of a deep red color. If the surface of the membrane is dried, only a few seconds will elapse before it is studded with little pearls of secretion, acid to litmus paper. In an ordinary condition of these glands a minute or more would elapse before any secretion would be observed, nor would the reaction ever be acid, except perhaps early in the morning. It is an open question whether the action of the parotid secretion and also that of these glands may not be normally acid for a short time before rising; whether this transient acidity is due to the same acid or acids that are present in the pathological conditions named is not known. Treatment, where the disease is simply a local manifestation of an undetermined constitutional condition, we can give alkalies, as these at least diminish the local effects upon the teeth, though this treatment may be only palliative.

In those cases where the disease is evidently due to an overworked condition of the patient, as is frequently the case in nervous children, these alkalies are of great value, as they improve the condition of the digestion. A large number of cases of ptyalorrhœa of this kind have been cured in a few months by this treatment. In other cases, where gout is responsible for the trouble, this treatment is also of value.

Local Treatment.—This should consist of the daily use of astringent and alkaline mouth washes. Where the disease is evidently local and confined to a few glands, these may be partly broken up by tattooing, or the use of electrolysis may be suggested.

PREPARING FOR THE ERUPTION OF THE FIRST PERMANENT MOLARS.

THE writer of the previous article also deals with the above-named subject, and the following is an abstract:—These teeth usually erupt when a child is six years old. They almost always decay, either during eruption, or shortly afterward. Until the eruption of the bicuspid, five years later, the anterior surfaces of these teeth are in contact with the first, or temporary molars. It is a well-established fact that contact between teeth will result in decay in most mouths. As the temporary molars are to remain in the mouth for a few years only, there is no objection to so cutting away the posterior surfaces of these teeth, so as to give as small a contact as possible between them and the first permanent molars. A dentist should always see a child shortly after the age of five years, in order that this treatment may be carried out before the permanent teeth erupt, because after this it is difficult to properly do the extensive cutting without injury to the permanent tooth, whose enamel is always soft at first. If it were possible to grind away the backs of the temporary molars, and thus prevent the permanent ones from ever touching them, the danger of decay would be slight, but there is a peculiar tendency in teeth, which has not been properly explained, or, so far as I am aware, noticed; this is the tendency which they show to move toward the front of the mouth. It is due to this tendency that it is not practical, in most cases, to maintain perfectly free spaces in the positions named.

The best one can do is to grind the backs of the temporary molars, so that they shall only touch the permanent teeth at small points near the grinding surfaces, for here contact will do the least harm: first, because the enamel is strongest there; and second, because, if decay should begin, it can be more easily managed than at any other point on the approximal surfaces.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

EXAMINATION QUESTIONS.

THE following written questions were given at an examination for the diploma in Dental Surgery, held on the 15th ult.:—

ANATOMY AND PHYSIOLOGY.

1. Describe the Tonsils, giving the structure of the Mucous

Membrane, the character of the Secretions, the Nerve and Blood supply, and the Surgical Relations.

2. Indicate the structures and describe the mechanism by which the Head is turned upon the Vertebral Column laterally.

SURGERY AND PATHOLOGY.

3. What Nerves are affected in the disease known as "Tic Douloureux"? Give the symptoms, diagnosis, and treatment.

4. How is Fistula of the Parotid duct produced? Give the treatment.

DENTAL ANATOMY AND PHYSIOLOGY.

1. Mention instances of Teeth modified to serve as weapons for sexual combat. Describe the Dentition of the Narwal.

2. Describe exactly the positions occupied by the six anterior upper (i) Temporary, (ii) Permanent Teeth in their crypts. How are they ultimately enabled to stand in a regular arch?

3. If a Tooth be disintegrated by mineral acids, what structures will the residue contain? Explain the origin of these resistant tissues.

DENTAL SURGERY AND PATHOLOGY.

1. What morbid conditions affect the roots of Teeth? How far are they remediable, and by what means?

2. What appearances have led to the supposition that Caries of the Dentine is an inflammatory affection? What are the arguments to the contrary?

3. Mention the various modes of securing Artificial Dentures, discussing their advantages and disadvantages. What circumstances favour or impede atmospheric adhesion?

PASS LIST.

The following gentlemen having undergone the necessary examinations, were admitted Licentiates in Dental Surgery at a meeting of the Board of Examiners on the 17th ult.:—Charles Albert Barstow, James Street, Harrogate; Alfred Ernest Jones, Stamford Hill; Josiah Mansbridge, West Hampstead; Charles Frederick Rilot, Grange Park, Ealing; George Oldham Whittaker, Blackley, Manchester; Charles Frederick Wright, Edgware Road; Thomas Henry Garland Wrighton, Buckhurst Hill. Seven candidates were referred to their studies.

BRIGHTON DENTAL HOSPITAL.

THE Brighton, Hove and Preston Dental Hospital, situate in Marlborough Place, Brighton, was opened to the public on July 1st. The Hospital is a small, unpretentious building, having been converted from a dwelling-house to its present purpose.

The honorary medical staff consists of the following:—Consulting Surgeons, Mr. G. F. Hodgson, M.R.C.S., L.S.A. and Mr. F. W. Salzmann, M.R.C.S., L.S.A.; Administrators of Anæsthetics, Mr. E. J. Tulk Hart, M.R.C.S., L.S.A., and Mr. W. J. Stephens, L.R.C.P., L.M., L.S.A.; Consulting Dental Surgeons, Mr. O. A. Fox, L.D.S.Eng. and Mr. W. L. Poundall, L.D.S.Eng.; Dental Surgeons, Mr. E. T. Ash, L.D.S.I., Mr. D. E. Caush, L.D.S.I., Mr. W. Harrison, D.M.D., L.D.S.Eng., Mr. S. P. Johnson, L.D.S.I., Mr. C. B. Stoner, D.D.S., L.D.S.Glas., Mr. John Wood, L.D.S.I., and Mr. W. R. Wood, Jun., L.D.S.I.: Mr. J. Wood has been elected Treasurer, Mr. W. Harrison Hon. Secretary.

The opening ceremony first began by a meeting held in the King's Apartments, Royal Pavilion, presided over by Councillor Dr. J. Ewart, in the unavoidable absence of the Mayor. The company afterwards visited the Hospital, which was declared open by Dr. Ewart.

NEW INVENTIONS.

COLOURING MINERAL TEETH.

MR. GEORGE POULSON, of Hamburg, has introduced a number of pigments with which to tint artificial teeth. The process is something like porcelain painting. The tooth is painted with the colour or colours that will produce the required tint. After having been dried in the flame of a spirit lamp, it is fired either in a muffle or under a piece of platinum in the blow-pipe flame, a process which takes about two minutes. Of course the tint thus produced is different from the colour of the unfused pigment. Therefore, some little practice upon some old teeth is first necessary. This process will be useful to those dentists who have only a limited stock of teeth, or who are not able to readily obtain supplies or any particular colour of teeth from a dépôt.

PITKIN'S POCKET BATTERY.

THIS is a very small secondary battery or accumulator, its size being $4\frac{3}{4} \times 3\frac{1}{2} \times 1\frac{1}{4}$, and weighs about $1\frac{1}{4}$ lbs. It will supply a

small lamp for about four hours' continuous use; but for such occasional use as the examination of a mouth it will last for a week or ten days, or longer. When not in use it retains its power, and this it is said to do for several months. When the accumulator is exhausted it can be re-charged either from a dynamo or from a Bunsen battery of three cells. This may be done at home, or it can be sent through the post to the makers. This battery forms a very convenient portable source of electricity. Where more power is wanted larger sizes are to be obtained. An illustration of it is given in the advertising pages.

JOURNALISTIC SUMMARY.

THE ARCHIVES OF DENTISTRY (*June*).

"A METHOD OF SAVING BADLY BROKEN SOFT TEETH," by Dr. C. T. Stockwell. If there is a class of teeth that has been, or is, more discouraging and perplexing to the dentist who is conscientious than the class characterized by "soft, white decay," I do not know what it is. And if *these* teeth are "badly broken down," what is to be done in order to save them from the merciless forceps?

To fill them with gold is like building a house upon a snow-bank in spring-time. To fill them with amalgam is little better, unless the old "copper" amalgams, so-called, are used. If we resort to the long lists of "plastic" filling materials, such as gutta-percha, oxychlorides, oxyphosphates, &c., we very possibly come nearer "*saving*" the teeth, but even then they require renewing every morning and replenishing every evening.

There is another method, the combined use of gold and tin. In cases of "*soft teeth*," where the cavities have four walls remaining, there can be no doubt that this combination—gold and tin foil in about equal parts, folded into ropes and used as ordinary ropes of soft gold or tin foil are used—is far superior to anything in ordinary use. But this hardly applies to the question before us, viz., "*badly broken down* soft teeth." My method may be stated in a very few words, viz., by the combined use of amalgam and gold in the same cavity.

For about two years it has been my almost universal practice to combine amalgam and gold in all such cavities. I first fill with

amalgam just as I would do if it alone was to be used, and at a subsequent sitting cut away such portions of the amalgam as may be desirable, secure good anchorage and finish with gold, so that when finished, especially with the front teeth, nothing but gold shall appear to the casual observer. The amalgam will turn black, but the gold retains its native appearance. With almost any case of "badly broken down" teeth, the original contouring of the crown may be easily and securely restored with amalgam, even if the original crown is almost or quite gone; and when once hard, it can as easily be faced with gold. And so those cases which are usually considered fit candidates for "gold crowns," I treat in this way, and believe that I thus have, in effect, a more substantial and permanent gold crown than would result from any method with which I am acquainted. Have treated many cases of "badly broken down soft teeth" successfully in this way, *after* gold and almost every form of "plastics" had been tried in vain. And one important fact uniformly appears in such cases. The *constitutional* condition of teeth *seems* to show marked improvement almost at once. The teeth seem to, and I believe do, become harder and more dense. At any rate I have never yet had occasion to remove, replace or patch one of these fillings.

There is another important result to be noted; teeth filled in this manner are always comfortable. There is no trouble from *thermal* influences. I had a marked case only a few weeks since. A central incisor was so "badly broken down," and was so "soft" withal, that I decided to resort to this method of treatment. The pulp was alive. The original contour of the crown was restored with amalgam and the patient dismissed for three or four days. When she again appeared the complaint of thermal influences was so great that I hesitated about proceeding with the original plan. She could not breathe through the mouth without a severe shock to the pulp ensuing. Finally deciding to proceed, I faced the amalgam with gold in a manner that gave the tooth the appearance of an ordinary large gold corner, covering about two-thirds of the cutting edge. After removing the rubber dam, and before she left the chair, I tested for thermal influences, both by breathing and with cold water. To my surprise—for I never had so marked a case before—she declared that no unpleasant sensation followed the application of either test. How to account for it I do not know. The fact can only be stated; but it is a fact that is

general, no matter how large the cavity or sensitive the dentine may be when the amalgam is placed in position.

My practice is, however, to always interpose a non-conducting cap over the pulp, when it is possible to do so, if the cavity approaches it. For this purpose asbestos felt is more frequently used than anything else. In no case where this method has been adopted have I had occasion to replace the fillings.

There can be no doubt at all that the combination—amalgam and gold—will create a current of electricity. The electricity will flow in the following direction,—amalgam, pulp, dentine, pericementum, saliva, gold.

“WEDGING—RAPID *v.* SLOW,” by Dr. R. M. Chase, Bethel, read before the Vermont State Dental Society, March 19th, 1886. While I do not expect everyone to be in accord with my views in regard to the subject under consideration, I will point out a few facts which go to prove the efficacy of rapid or positive separating, especially the twelve anterior, or front teeth. Some obtain the space desired in three seconds, some in three hours, some in twelve hours, some in one day, some in one week, and others it takes about two weeks, to say nothing of the inhuman sacrifice of tooth structure with the file, disc and chisel. I have tried about all of these methods with unsatisfactory results, except the first, or the three seconds' method. While this may seem heroic at first, I think you who follow it day after day will experience less annoyance and unpleasantness from this method than any other.

Wooden wedges driven between teeth with a mallet or its equivalent is, perhaps, as old as any operation in dentistry, and, I might say, as disagreeably painful, for the reason that your patient experiences the shock of the blow, both real and imaginary, also the inward pressure as well as the lateral while forcing the wedge into place, while the wedge forceps only produce the lateral pressure, the inward being prevented by the rubber cushion forming a fulcrum or elastic bearing, while the opposite beak carries the wedge between the teeth sufficiently to separate and obtain the required space.

A little practice with the wedge forceps will make separating practically easy, and I have yet to learn of a case so separated followed by any inflammatory action. I cannot say as much for the slow process, for I have seen teeth worked upon which were

separated by the various slow methods, which, to use the patient's words, was like touching the eye.

The Jarvis and Perry separators work upon the same principle; that is, they separate as rapidly as it is possible to do with the screw principle. With them your patient begins to realize what is going on, as you give the screw another turn, and by the time the desired space is obtained, is thoroughly disgusted. In this respect you have the advantage with the wedge forceps; before your patient has hardly time to think the wedge is adjusted, the space desired is gained, and the room to make that which is most desired by us all, a thoroughly perfect filling.

SOUTHERN DENTAL JOURNAL (*ATLANTA, June*).

"ETHICS," by John C. Story, M.D., D.D.S. The writer treats this subject under the following heads:—

First. The relations of the dentist to his patients, and, *vice versa*, of patient to dentist.

Secondly. The relation of the dentist to his profession.

Thirdly. The relation of the dentist to the community at large.

The office should be convenient in all its arrangements, and only be excelled in neatness by that of his own person; and, whilst it is unnecessary to make an extravagant display, the office should show that it is well kept. Neither need the dentist appear with dudish, tight pants, and hair parted in the middle, but his apparel should at all times be neat and clean, and his hands—well, his duty to his patient requires him always to wash before he begins work, and that to himself to do the same as soon as he gets through.

Presuming the dentist knows best what is to be done, how it is to be done, and what it is to be done with, any suggestions from the patient being entirely out of place and unnecessary, tending only to embarrass the judgment of the operator. The facts bear me out that the patient who has the least to say in the way of dictating usually gets the best work.

Each family should have its dentist, who should be regularly consulted by each member, and especially the children, that their teeth may have his early attention; and his instructions should be followed to the letter, thereby preventing much unsightly irregularity and deformity, as well as arresting early decay and

consequent loss of teeth. For obvious reasons the family dentist should not be changed.

Dentistry being a high and honourable profession, it is the incumbent duty of every one entering its ranks to exert himself with all his ability to maintain that dignity and honour, to elevate its standing and enlarge its usefulness.

A voluntary examination of the work of another dentist, with an expression of opinion, is not in keeping with the best interests of the profession. When called upon to do so, for any cause, by the patient of another dentist, always name and demand the fee in advance ; this being refused, you should refuse your services.

“ DENTAL JURISPRUDENCE,” by R. B. Adair, D.D.S. It is a strange fact that so few cases for damages have been brought against dentists for malpractice. I have only been able to find but one recorded in our journals, notably a case against a dentist of New York for damages. The dentist in this case extracted a tooth for his patient while under the influence of gas. A piece of the tooth flew down the patient's trachea, causing pain and suffering for four weeks, when it was coughed out. The patient was awarded 500 dollars damages.

The judge, in his charge in that case, said : The law holds that no person should assume extra responsibility in the management of any case without bringing to the same a corresponding amount of skill to meet emergencies. The same holds true, said the judge, regarding every step in any operation, the surgeon being bound to exercise his best judgment, his most watchful care, and greatest skill for the benefit of his helpless and trusting patient. This was the opinion of Judge McAdams (Supreme Court Judge), after the case had been tried in the court below, and sustaining the verdict of the same.

From the above ruling, it is clearly shown that the dentist would be liable for any other operation in dentistry unskillfully or negligently performed. Under this ruling, if a dentist should extract two teeth at once, as has frequently been done, or extract a tooth that should be saved, or make a mistake and extract the wrong tooth, or should fracture the jaw, or let his instrument slip and fracture a sound tooth, he would be liable for damages. If he should put arsenic in a tooth, and use too much, and fail to properly seal it up, and it should escape from the tooth and destroy

the alveolus and part of the jaw, and cause pain and suffering, he would be liable for damages. If a dentist should fill teeth in the manner in which I saw some filled a few days ago, by filling continuously from one proximal cavity across the space between the teeth, and into the other cavity, and about double the quantity of amalgam or filling material packed under the margin of the gum, causing pain and suffering as that did, he would be liable. If he should construct an artificial piece in such a manner as to cause absorption and flabbiness of the ridge, or inflammation of the mouth, he would be liable.

The foundation of the doctrine is, that one who undertakes any office, employment, duty or trust, contracts to perform it with integrity, diligence and skill. It should not be a matter of dollars and cents with the dentist, but for the good of his patient. The dentist has no right to extract a tooth just because his patient wants it done, or to perform any other operation, unless it is best for the good of the patient. It would be his duty rather to refuse to render such services than consent to perform any operation which, in his judgment, is not best.

THE INDEPENDENT PRACTITIONER (*NEW YORK, June*).

"CALCIFIC DEPOSITS IN TOOTH PULPS," by Edgar D. Swain, D.D.S. The changes which I shall discuss are those known as osteo dentine, reparative dentine, and calcification islands or pulp stones; the last-named are supposed to be the cause of prolonged and sometimes acute odontalgia or neuralgia, but just how to account for their presence, or how to diagnose their existence in a tooth pulp not sufficiently destroyed with caries to expose the affected member, is as yet an unknown quantity among the many other accomplishments of our profession.

During the year of 1879 I procured three hundred and eighty teeth in various stages of disease, the majority of them being mere wrecks of once beautiful structures.

The first two hundred with exposed pulps produced eighteen in which I found calcific deposits of greater or less size; the third hundred, with pulps not exposed, furnished me with eleven more fair-sized jewels; sixty, composing the third lot, were slightly carious, and added five more of the precious gems to my collection; and lot number four gave me an addition of three. Believing that some less affected than the thirty-seven mentioned had escaped

my observation, I concluded it fair to estimate the number thus diseased at twelve per cent., which I now believe to have been a very low estimate.

From my observations I have arrived at the following conclusions as to their appearance, formation, and the causes which produce them :—

First, pulp stones are never connected with the dentine, but there always intervenes between the two a layer resembling a dead or desiccated membrane. This membrane evidently consists of the layer of atrophied odontoblasts, and is consequently unable to extend the work for which they were intended, namely, to appropriate and deposit the lime salts which the circulatory system continues to supply. As a consequence, the salts thus liberated by osmosis are organised into islands of calcification in the body of the pulp, surrounding the fibres and vessels, thereby giving the appearance sometimes observed of dentinal canals. This class of pulp stones is not to be confounded, however, with another which so closely resembles true bone, always presenting lacunæ. These last are the result of a transformation of connective tissue cells into osteoblasts, and sometimes to the extent of entirely obliterating the pulp cavity. I have a specimen of this character, and have seen others which have led me to conclude that this kind of pulp calcification never occurs in a fully-developed tooth, but commences at that period when the apical foramen is large, and the impetus or exciting cause is derived from the osteoblasts or bone builders, which produce the cementum. Their influence over connective tissue cells transforms them into osteoblasts, which appropriate the lime salts intended for dentine and obliterate the pulp cavity by filling it with cementum.

The theory which I have evolved regarding the formation of the islands of calcification in the pulps of the teeth is: First, that the odontoblasts have become atrophied and are no longer capable of performing their normal functions.

Second, that the circulation at the time of their formation is normal and the necessary amount of lime salt is conveyed into the pulp when required either for the purpose of building dentine in tooth development, or dentine of repair, but the atrophied odontoblasts being incapable of appropriating them for either purpose, it is therefore deposited within the tissues of the pulp.

Third, that the lime salts having been passed by osmotic forces

through the coats of the vessels, and not being appropriated, and no endosmotic force being present (because of the otherwise normal conditions), meeting with the necessary organic material in the form of albumen, the two unite as in the experiment, and the production is a calcospherite.

“TESTING THE POWER OF ANTISEPTICS,” by Dr. W. D. Miller, Berlin. A disinfectant, according to the definitions of Koch, Fluegge and others, is a substance which retards the development of micro-organisms, and in proper concentration kills them; for most purposes the more inert the substance is chemically, the better; in fact, the chemical action of many antiseptics is one of the greatest impediments to their free use in medicine.

A very simple method of determining the strength of any antiseptic, as well as its rapidity of action, is the following:

(1.) To determine the lowest degree of concentration necessary to prevent the development of a given fungus, prepare a large number of tubes, each containing, say, 5,0 cc. of a sterilized nutrient solution (say beef-extract 1,5, peptone 1,5, sugar 1, water 100). Add to the first tube a sufficient quantity of the substance to make its strength 1 to 10. To the second tube add enough to give a strength of 1 to 20, then 1 to 50, 1 to 100, 1 to 1,000, &c. Infect these solutions with the fungus to be tested, and then keep them at a temperature favorable to its development. In all tubes which remain clear, the concentration is sufficiently strong to prevent the development of the fungi; in those which become cloudy, not. By the first experiment we establish the fact that the limit lies between certain numbers, say 1 to 4,000 and 1 to 5,000. Repeating the experiment with 1 to 4,000 as highest and 1 to 5,000 as lowest concentration, we find the limit somewhere between 1 to 4,500 and 1 to 4,600; a third experiment will then determine at just what concentration development ceases.

To determine the rapidity with which a certain substance (in solution) acts, proceed as follows: Place a few drops of the substance to be tested in a sterilized watch glass; add to this, on a loop of platinum wire, a minute drop of a bacterium culture, stirring it quickly with the wire; then transfer, at given intervals, a very small drop to culture tubes, which keep at a favourable temperature for the development of the fungi. If the exposure was sufficiently long to devitalize the fungi the tubes will remain

clear ; otherwise they will become cloudy in a few hours, or in two or three days at most.

"SCYTHIAN DENTISTRY," by W. H. Eames, D.D.S.

"A RETROSPECTIVE GLANCE," by Herbert A. Birdsall, D.D.S.
The purpose of this paper is to show, or perhaps rather to suggest, the relation of the dentistry of fifty years ago with the dentistry of to-day.

"SANITAS OIL," by Dr. E. S. Talbot.

At the April meeting of the Central Dental Association of New Jersey, Dr. H. A. Parr gave a description of a separator possessing the following advantages or qualities: First, it is universal in its application. It can be adjusted to the upper or the lower teeth to molars, centrals or bicuspsids equally well. Second, it is particularly adapted to irregular teeth. Third, it may be advantageously employed in the correction of many cases of irregularity. Dr. Pinney said the instrument had been applied to his teeth, and he thought it the most complete little machine that he ever saw. Without any pain or trouble, it separated his teeth so far apart that they could be easily filled ; and it was done in five minutes, and a greater space obtained than would have been obtained in three or four days with wedges.

The editorial department contains articles upon "ALVEOLAR ABSCESS," addressed to junior dentists, the American Dental Association, and the Kansas and the Illinois State Societies. "POST GRADUATE STUDY" has special reference to those graduates who wish to increase their knowledge.

What shall be done for these men? They are engaged in practice, have families dependent upon them, have many ties which bind them to home, and hence it is impossible for them to attend any of the higher schools, or to go abroad for study. Is it not practicable to establish a grade of study to be pursued at home, to mark out a systematic course to be pursued under competent instructors, the tuition to be obtained through correspondence or by the publication of courses of lectures on definite themes, somewhat after the manner of the Chautauqua Literary Course, but modified to suit the exigencies demanded?

THE DENTAL COSMOS (*PHILADELPHIA, June*).

"ARE FUNCTION AND DESIGN AND CONSCIOUSNESS ENTITIES?"
by T. Dwight Ingersoll.

"ON THE LIMITS OF USEFULNESS IN DENTAL OPERATIONS AND THE PRESERVATION OF UNFIT TEETH," by Dr. A. Howard Thompson. Of recent years our artistic attainments have reached a height undreamed of in the student days of most of the dentists in practice to-day. This is especially true in the new field of crown and bridge-work. But to the cautious and conservative mind there will often come the disagreeable thought, like a misgiving, that the progress of the day in dentistry is too much toward high art, regardless of physiological requirements. The ambition is to produce artistic dental jewellery, without scientific consideration of the anatomical limits of endurance.

"DENTAL CARIES," by Dr. A. Morsman. This is the ninth article of the series, and deals with lesions of the pulp.

"THE EVOLUTION OF ARTIFICIAL TEETH—CAPS AND CAP CROWNS AND BRIDGE WORK," by Dr. W. Storer How. This article is illustrated with 47 woodcuts.

"MOVING INDIVIDUAL TEETH," by Dr. Eugene S. Talbot. This is a description of the application of pianoforte wire.

The March meeting of the New York Odontological and the Annual Meeting in December of the First District Dental Society are reported. At the latter gathering, Professor R. R. Andrews exhibited a number of streopticon views of the development of the teeth, and these are reproduced as illustrations.

OBITUARY.

WE regret to announce the death, on May 19th, of Major Robert Edward Stewart, L.D.S.Eng., at the age of fifty-five. Major Stewart was well-known as a worker in dental, public, and volunteer matters. He was lecturer on Mechanical Dentistry at the Liverpool School of Medicine; one of the founders and a member of the consulting staff of the Liverpool Dental Hospital. He was a member of the Odontological and the Odonto-Chirurgical Societies, and of the British Dental Association, as well as of several other local societies. His funeral was attended with full military honours.

WE regret to have also to announce the death, after a long illness, of Mr. Isidore Lyons, L.R.C.P., M.R.C.S., L.D.S., L.S.A., late Dental Surgeon to St. Bartholomew's Hospital.

Editorial.

AMENDMENTS OF THE DENTISTS' ACT, 1878.

ON the 25th of June the *Medical Bill* became law. Section 26 relates to dentists. It is as follows :—

It is hereby declared that the words "title, addition, or description," where used in the Dentists' Act, 1878, include any title, addition to a name, designation or description, whether expressed in words or by letters, or partly in one way and partly in the other.

There shall be repealed so much of Section 4 of the Dentists' Act, 1878, as provides that a prosecution of any of the offences above in that Act mentioned shall not be instituted by a private person, except with the consent of the General Council or of a branch council, and a prosecution for any such offences may be instituted by a private person accordingly.

Notwithstanding anything in Section 5 of the Dentists' Act, 1878, the rights of any person registered under the Dentists' Act, 1878, to practise dentistry or dental surgery in any part of Her Majesty's dominions other than the United Kingdom shall be subject to any local law in force in that part.

It shall be lawful for Her Majesty at any time after the said appointed day to declare by Order in Council that Section 28 of the said Dentists' Act, 1878, shall be in force on and after a day to be named in such Order, but in the meantime and until such Order has been made, and before such day as last aforesaid, such section shall not be deemed to be in force.

Save as in this Act mentioned the Dentists' Act, 1878, shall not be affected by this Act.

The first paragraph is of considerable importance, inasmuch as it is specially directed at those unqualified practitioners who use after their name certain letters or designations which are misleading. M.S.D., R.S.M.D., are some of the make-believe titles used by the unscrupulous and advertising dentist. Though this expository amendment of the Dentists'

Act is intended to further circumvent the mystic sham of the pretender, there will remain some means by which the advertiser may extol his virtues and trade upon the unwary and credulous public.

The other sentences or provisions of the Amendment are self-evident, and no observations need now be made upon them.

NATIONAL DENTAL HOSPITAL.

THE dinner which was held on the 29th ult. in behalf of the funds of the National Dental Hospital was a great success. The receipt of nearly £500 was announced as the result of that special effort. The Hospital has struggled with not a few adversities. But with this latest success, characterised by a recognition of the charity in the great City of London, the Committee of Management may take fresh courage and continue the good work which has characterised their efforts, particularly during the past ten years. A good cause worked with earnestness of purpose and persistence in effort is sure of reward and success. This truly is the case with the National Dental Hospital.

Its usefulness and benefits to the suffering poor are widely and daily manifest—the patients attending being of the poorest and most necessitous class. Its management is exemplary. In the April number of the RECORD, p. 187, there is given a tabular statement of the relative expenses of the two metropolitan and two provincial dental hospitals. In that table the National Dental Hospital compared most favourably as regards cost per patient, cost per case, and cost per filling.

The subscription list shows a want of sympathy and support on the part of members of the profession. The more widely our dental hospitals and their work are known—their benefits to the poor, as essentially necessary training grounds for the ever-rising generations of dentists, as the cradles of the technical proficiency and ability which the affluent can command—the better will it be for the dental profession at large as well as for the hospitals themselves.

GOSSIP.

At the ordinary meeting of the Students' Society of the National Dental Hospital, held June 4th, Mr. Willoughby Weiss L.D.S.Eng., President, in the chair, Mr. C. G. Carter brought forward a model of an upper jaw of a patient about forty years old, showing two large supernumerary teeth displacing the permanent centrals; he also presented to the Museum two upper molars with four roots each, and a bifid lower lateral of the permanent set. Mr. Jones showed models of hypertrophy of gums in upper and lower jaws. The patient has since been operated on at St. Bartholomew's Hospital. Mr. Fripp showed two supernumerary teeth, from a patient about forty years old; they were situated in the molar region, and were both much decayed when removed. Mr. Fripp then read his paper on the "Preparation of the Mouth for Artificial Dentures and the Insertion of the same" (see page 292).

HIS GRACE the Archbishop of Canterbury has accepted the office of a Vice-President of the Dental Hospital of London, Leicester Square.

MONTHLY STATEMENT of operations performed at the two Dental Hospitals in London, and at two Provincial Hospitals, from May 1st to May 31st, 1886:—

	London.	National.	Birmingham.	Manchester.
Number of Patients attended...	2,632	1,713	985	966
Extractions { Children under 14	405	435	666	738
Adults ...	876	611		
Under Nitrous Oxide	734	430	33	50
Gold Stoppings ...	281	82	8	19
Other Stoppings ...	1,249	559	73	111
Advice and Scaling ...	119	283	—	—
Irregularities of the Teeth ...	125	235	4	—
Miscellaneous ...	141	147	201	350
Total ...	3,930	2,782	985	1,268

MR. JOHN T. HUGHES has been appointed Dental Surgeon to the Hospital for Consumption and Diseases of the Throat, Bowdon, Cheshire.

DR. W. H. WAITE, of Liverpool, is negotiating the sale of his practice. On inquiry we understand, says *the Journal of the British Dental Association*, that Dr. Waite's sight has recently been very seriously threatened, and that now certain defects have in both eyes assumed an active character, and we regret to say that the power of vision is likely gradually to diminish even under the most favourable circumstances. Those who know Dr. Waite by reputation will read this with deep regret; but how can we express the feelings of those who know him personally, and who have by contact with him learned to appreciate him both intellectually and morally? They alone can tell the loss sustained by the religious and charitable societies of the city in which he has so long laboured, and those who have worked with him in the cause of dental progress can alone estimate the loss which we sustain in this overwhelming calamity. It is sad to reflect that his unsparing exertions on our behalf may have, in a measure, hastened the advent of this misfortune, and we now know that, with this dark cloud hanging over him, Dr. Waite has, for months past, worked for us as if all were well.

THE British Association for the Advancement of Science will hold its annual meeting at Birmingham, commencing on September 1st.

ARTHUR S. UNDERWOOD, M.R.C.S., L.D.S.Eng., has been appointed Dental Surgeon to the Dental Hospital of London, *vice* Henry Moon, M.R.C.S., L.D.S.Eng., resigned.

THE Annual Meeting of the British Medical Association will be held at Brighton, on August 10th, 11th, and 12th.

DURING the last Lent term 58 students attended the engineering courses and workshops under the care of Professor Stuart at Cambridge University. Of these 32 were to be engineers; 7 were to engage in manufactures in which a knowledge of engineering was desirable; 3 were going into the army; 2 were to become teachers. As to their University position, 9 were M.A. or B.A., 21 were ready for the Mathematical Tripos, 2 for the Natural Sciences Tripos, 18 for the Special Examinations in Applied Science; 6 had only come to the University for a year's work in the workshops; 5 were not matriculated students.

THE building and aquarium fittings of the laboratory of the Marine Biological Association, at Plymouth, are now in course of construction, under the supervision of a committee of five, of whom Mr. Spence Bate, F.R.S., L.D.S.Eng., is a member.

THE Students' Society of the Dental Hospital of London will give a conversazione at the Marlborough Rooms on Tuesday, the 20th inst., at eight o'clock, when the distribution of prizes to the students of the school will also take place, Mr. Smith Turner presiding.

SIR HENRY ACKLAND, in the course of his presidential address at the commencement of the recent session of the Medical Council, said:—"The old traditional notion is not yet exploded that the titles of Fellow or Doctor, howsoever obtained, imply distinction. Is not the time now coming when an educated public will know that it is not the name, but the body that gives the name, which sets a stamp of honour or of nullity?"

THE University of Dublin has decided to confer the degree of LL.D. on John Tyndall, F.R.S., Professor of Natural Philosophy in the Royal Institution of Great Britain. Dr. Ingram, in asking this grace of the Senate, said Prof. Tyndall was a distinguished Irishman who stood in the foremost rank of living physicists, and there was scarcely any branch of physics with which his name is not honourably associated. Heat considered as a mode of motion, the absorption and radiation of gases and vapours, the phenomena of diamagnetism, and the relations of magnetism and diamagnetism to molecular structure, the floating matter of the air in relation to putrefaction and infection, the motion of glaciers, the methods of lighthouse illumination, and the theory of sound—all these subjects had been investigated by him. He was a master of the art of scientific exposition, as might be seen in his accounts of Faraday as a discoverer, and of Pasteur's researches on spontaneous generation; and as a writer he possessed a vigour, elasticity, and occasional elevation of style which many men of letters might well envy.

THE German Association of American Graduates in Dental Surgery has started a journal of Dental Surgery (*Journal für Zahnheilkunde*), published in Breslau.

THE DENTAL RECORD.

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THE ELECTRO-DENTAL ENGINE.

By THOMAS ROWNEY, L.D.S.Eng.

ELECTRICITY, as a motive power, more nearly fulfils all the conditions required by the dental operator than any other form of energy with which we are acquainted. It will drive his drilling engine, vibrate his mallet, and light his lamp—a willing servant ready at a moment's notice to do his bidding, for several hours per diem, for several months without ever a failure. But with it as with a good horse, there must be intelligence in employing it, or it may prove restive and come to a dead stop. It is just this want of intelligence in its use which has been the cause of a growing distrust in this useful servant, until many have ceased to use it, and have consigned both battery and dynamo to the lumber room. That this is the case is shown by an instance which came under my own observation, in which a good operator who for some weeks had used most satisfactorily an electric mallet, found it necessary to recharge the battery and renew the plates. This was done, but when done the mallet refused to vibrate. How many mild anathemas rose to his lips I cannot say, but he gave the mallet a long holiday, and the battery was cast aside as a troublesome and valueless toy. A moment's examination and the source of trouble was found—he had connected the wires each with a zinc plate as a terminal.

I do not suppose that any who read my article have ever made so great a mistake as the one related. But I pray you bear with me while I tell of some subtle causes of failure with which I had to deal in the early months of my use of the electro-dental engine.

Nearly four years ago, tempted by a well got-up circular, which set forth the merits of a battery for dental use, I invested

some £3 or £4 in the purchase of one. The instrument was a production from the other side of the Atlantic, and I suppose I was captivated by the tall talk of the maker. I am afraid my expectation was raised too high, but I certainly expected that an instrument at such a price would be a nice piece of mechanical work. The reality did not accord with the ideality, and had I been called upon to name the maker from his work, I should have said he was the flaming tinker of Mumper's Dingle, or one who had served an apprenticeship with that noted character of George Borrow's. But, *n'importe*, when put together, and charged with bichromate of potass and sulphuric acid, the battery did its work nicely, and for a week or two all went well. I was delighted with my new servant's constancy and devotion to my wants; but put not too much trust in batteries, for they all contain an element of failure, which revealed itself in this one at a most inopportune moment, and I was compelled to fall back upon my old and tried friend, the ordinary dental engine.

It was not until the engagements of the day were finished that I could give attention to the battery, and then I had to seek for some time the cause of its enfeebled power. The connections were all right, the fluid could not be exhausted in so short a time, but, on examining the zinc plates, I found them coated with a green sesquioxide of chromium, mixed with perhaps a lower oxide of the same metal. This had polarized the battery. The plates were unshipped, cleaned, and replaced, and once more all was in going trim, but again and again there was the same trouble, until at last I determined on trying another formula for the solution. I consulted an article in a well-known dental publication, written, as I supposed, by an experienced scientist, and adopted the formula there given. With this the battery was charged, and for a few days all went swimmingly, but, alas! for human hopes, a week of several hours per day saw my idol shattered and my dynamo making only a few feeble revolutions per minute. Battery or dynamo, which was the culprit? The former had it, for on examination, I now found the carbon coated with amythestine crystals of chrome alum.

It will be seen from these dissimilar causes of failure that if we would work a battery successfully they must be studied and understood. In the most simple form of battery in which water and sulphuric acid only are employed, the water has to furnish

the oxygen to the zinc element before it can be dissolved by the acid, while the hydrogen escapes at the copper or negative plate. Unfortunately there is a great tendency in the hydrogen to adhere to the negative plate, and in doing so it prevents the fluid coming in contact with that plate. Now, as the electricity passes from the zinc through the fluid to the copper and thence from the battery, this want of contact prevents it from circulating, and the battery becomes polarized. So it was with the chrome alum crystals on the carbons in the one case, and with the sesquioxide of chromium on the zinc plates in the other. In the one case it resulted from the solution being too strong, and in the other case from an insufficiency of sulphuric acid.

If we consider for a moment the changes which take place in a single cell when charged with bichromate of potass and sulphuric acid, all will be, I hope, made plain enough for practical purposes.

If potassic bichromate is dissolved in water to saturation and sulphuric acid be added in certain definite proportions, the former is decomposed, potassic sulphate is formed, and chromic acid is set free and remains in solution. It is this chromic acid alone which is usefully operative in the battery. The potassic sulphate is utterly valueless, after having entailed the cost of something like one-third the sulphuric acid added alone.

Now, the chromic acid furnishes the oxygen, and there should be no escape of hydrogen at the carbon plate. If there be, it will result from the imperfect amalgamation of the zinc plates. It will appear, therefore, that if chromic acid and sulphuric acid be used minus the potass, we shall have a battery of greater power for the sulphuric acid used. This was the modification I adopted some months since, and I am certain, if the formula* given below be strictly adhered to, the electro-dental engine will have a new life. They who have cast it aside may reinstate it in the laboratory in the assurance that it will never disappoint them. It is not only in its certain and regular action that the value of this formula consists, but we get rid of the inconvenience

* Chromic acid	...	...	...	...	8 oz.
Water	...	...	...	...	8 lbs.
Sulphuric acid	...	...	...	...	16 grs.

Dissolve the chromic acid, and add the sulphuric acid gradually while stirring.

of having at every recharging of the battery to pour away six gallons of fluid. The solution once made may be resuscitated again and again with fresh portions of chromic and sulphuric acids until so much chromic salt and sulphate of zinc have been formed that the water can dissolve no more. By the time this has obtained, a set or more of zinc plates will have been used up.

Here a word of caution, the result of a recent observation.

If the proportion of sulphuric contained in the solution be less than is necessary to dissolve the sesquioxide of chromium as formed, the same will be deposited on the zinc plates. It will be well, therefore, to examine the plates occasionally after the solution has been in use some time, and should they show a dirty green surface more sulphuric acid must be added—say two ounces by measure to each cell; possibly, also, the plates may need re-amalgamation.

Of zinc elements none are equal to those cut from good rolled metal, $\frac{5}{16}$ ths of an inch thick. The second set I used were cast and well amalgamated, but from their crystalline structure they proved of little value. The acid attacked them irregularly, and disintegration, quickly followed by holes, rendered them useless in a week or two.

The rolled plates I mount by drilling a hole in the centre of one end and tapping it with No. 5 Whitworth thread. A piece of steel wire, No. 8 gauge, has a thread cut on each end, one of which is screwed into the zinc, the other passes through the board of the battery and is fastened with a thumb-screw, a ferrule, made from a thick brass tube, being first slipped over the pin to regulate the distance between the plate and the board. A set of these pins and ferrules made nearly four years ago are still doing duty.

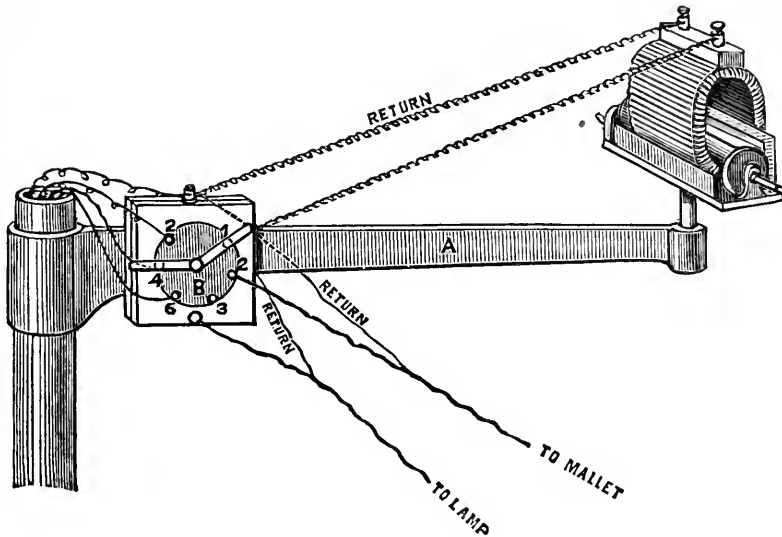
It is a good plan to have a double set of these, and of plates also mounted, so that any worn-out plates can be replaced.

The dynamo I adopted was made by an English firm. It has more power than the Giscome, and is very little larger. It underwent some modification at my hands before it satisfied me. It can, I believe, be now obtained with these modifications, which I have had no reason since to alter.

At first I suspended the dynamo from a movable arm attached to the ceiling of my operating room, but its oscillations proving troublesome in delicate operations, such as the drilling of retaining

pits and opening of pulp cavities, led me to mount it upon a second swinging arm attached to my operating chair.

The arrangement which in my hands has proved the most satisfactory is shown in the accompanying sketch.



A is the upper swinging arm which moves on the upright attached to a White's chair. The dynamo is mounted on a brass pivot which works in a hole in the extreme of the arm, and has thereby two motions, which adapt it and the hand-piece to every position which can be required by the operator. Of the hand-piece and its attachments I may say more hereafter. The upright upon which the arm swings is a steel tube, whose inside and outside diameters are respectively 1 inch and $\frac{3}{4}$ of an inch. Through this tube pass four flexible silk-covered copper wires, long enough to allow for the rise of the chair without putting any strain on them. One of these is connected with the zinc terminal of the end cell of the battery, and conveys the return current. The other three are respectively joined to the carbons of 2nd, 4th and 6th cells, and convey the electric energy to the lamp, the mallet or the dynamo, as desired, through the clock-faced switch shown at B.

The advantage of this switch is that the current can be instantly turned on to any of the three instruments, without leaving the patient; its structure is simple, and it can be readily made by any one who possesses a lathe. On a plate of ebonite $\frac{1}{16}$ thick and 3 in. square, a circle is drawn $2\frac{1}{2}$ in. in diameter. This circle is divided into eight equal parts; on six of them holes are drilled with square

countersinks. Into these, brass studs with long threaded shanks are screwed, which pass through and project behind $\frac{1}{4}$ of an inch. These projections are fitted with nuts; to the three, nearest the upright steel tube, which are numbered 2, 4 and 6, are fastened the wires proceeding from the carbon plates. To the other studs, numbered 1, 2, 3, are attached single wires connected respectively with lamp, mallet, and dynamo. In the centre of the ebonite plate is a pillar of brass, $\frac{3}{8}$ of an inch high; on this is fitted carefully a pair of brass hands, having pointed styles passing through them at a distance from the centre corresponding to the circle on which the studs are placed. It will be seen that on these hands being moved, one can be placed on a stud in connection with 2, 4 or 6 cells, while the other hand can be put upon the stud corresponding to any instrument which may be wanted. The circuit being completed through the hands, any number of cells may be employed for each instrument according to the power required. The ebonite plate is attached by screws at two of the angles to a piece of mahogany $\frac{1}{2}$ inch thick, the latter being fastened to the swinging arm by two screws at the back.

On this mahogany piece is a binding screw corresponding to upper space on face plate. To this screw the return wire before named is attached, and also the return wires from the several instruments. The readiest way of making these connections is by forming the end of the wires as rings and then flushing them with soft solder. They are then slipped over the pin and the nut screwed home.

In the lower space of ebonite plate there is an ordinary binding screw, to which the wire is attached, carrying the current to the lamp. This was found to be handy, as it admits of the ready removal of lamp, which is not in frequent use.

Dynamos have their vagaries, and want intelligent handling to ensure success in working them. The bearings in which the armature revolves want careful lubrication with oil which will not clog. The best is obtained in the manufacture of candles by Messrs. Price & Co.; it equals the finest sperm oil and is free from any unpleasant odour. Then, again, the springs want careful adjustment, so that they may rest fairly and firmly on the commutator. To these oil must not be applied, or there will not be that perfect contact which ensures success.

The commutator is worthy of a few minutes' examination.

It is made up of a piece of brass tube divided lengthwise. The two pieces thus formed are mounted on a hard wood base, through which runs one of the axes of the armature. Their use is to change the direction of the current, so that they may both flow the same way. That they may do this perfectly they are insulated the one from the other, and it is necessary occasionally to examine them to see that the spaces are not filled with particles of brass, resulting from the abrasion of the springs and of their own surfaces, a condition which is likely to occur from the absence of any lubricant. This may seem a trivial matter for comment, but it cannot be neglected in practice if all is to go well.

The position for battery which I have found to be most convenient is on the right of the chair, the wires being carried along the floor, and covered with a strip of brass, slightly concaved, to protect them from the feet. There are other and minor particulars, into which it is not necessary to enter, as they will readily suggest themselves to the mind of the ingenious mechanic.

Of all plans for working the battery, give me the ordinary treadle. By it the plates can be immersed to any depth, and the current can be regulated to a nicety. There is no need for resistance coil in using the lamp, provided the operator has his wits about him, and carries out the arrangement of which I shall say something in an article on the lamp in another month's issue.

With the mallet, the operator may have a succession of blows that would not harm a fly, or he may have the full power of the instrument at will; so also with the drilling engine.

I use the Hodge hand-piece—there is none like it—and in lieu of the long attachment usually sent out with dental engines, I made one about two inches long, to which any hand-piece can be attached and detached in a moment. I also found it necessary to construct a cable and sleeve, as I could not obtain any long enough for my purpose. These cost me some thought and labour, but the leisure of winter evenings passed in my country home were pleasantly employed in working out these small matters. With lathe and other mechanical appliances at hand such work is a labour of love; but if these are not at the disposal of the operator, with the experience which only comes from long use of such tools, he had better purchase what he wants. I shall have pleasure in placing

in the hands of the Dental Company all the drawings necessary for carrying out the arrangements described.

The chromic salt can be obtained of them in sealed tins at a cost but little in advance of the price paid for bichromate of potass.

ALUMINIUM BRONZE IN MEDICINE AND DENTISTRY.

PROFESSOR C. SAUER, Instructor in Dentistry at the Royal University of Berlin, strongly recommends this bronze for the under layer of teeth-plates and other purposes. It is an alloy of nine parts of copper and one part of aluminium. It admits of almost as ready stamping and pressing as pure silver (which, next to pure gold, is the softest metal), and it has, besides, the elasticity of steel. In form of wire, aluminium bronze possesses a power of resisting tension approaching that of steel wire. These characteristics render it capable of substitution in many cases for silver, and for silver and gold alloys. The melting point of the bronze is higher than that of pure gold— $1,000^{\circ}$ C. It may, accordingly, be made red-hot without danger of melting, and manipulated with hard solder. It is soldered with fourteen or sixteen carat red gold, which is more capable of resisting chemical influences than silver solder, which contains zinc. Aluminium bronze is almost one-half lighter than fourteen carat gold.

Professor Sauer has made various experiments with aluminium alloys: the zinc alloy was unstable, the zinc oxidising in the mouth, with gold and platinum alloys the aluminium decomposed, whereas in two cases aluminium bronze placed in the mouth under the influence of a galvanic current did not, after the lapse of four weeks, suffer loss of weight. The bronze oxidises only superficially in the mouth. There forms upon it a kind of patina, such as is formed in the wearing of plates of fourteen, sixteen, eighteen, and even twenty carat gold. It admits of manufacture into spiral springs, plates, screws, canulas, &c., for surgical purposes. Even knives have been manufactured from it. A solution of corrosive sublimate of one to one thousand affects it superficially. For its disinfection carbolic acid is to be preferred, as it does not attack the bronze. Gold aluminium bronze acts similarly, but oxidises to a greater extent, is softer, and not so elastic, and therefore is to be used as green gold or as twenty carat gold is used.—*The Therapeutic Gazette*.

FLAME CONTACT, A NEW DEPARTURE IN WATER HEATING

By THOMAS FLETCHER, F.C.S.

A PAPER read at the Meeting of the Gas Institute, London, on June 9th, of which the following is an abstract:—

It is my intention to prove to you on theoretical grounds, and also by experimental demonstration, in such a manner as will admit of no possible doubt, that the present accepted system of water heating, by gaseous or other fuel, is a very imperfect means for an end, and is, both in theory and practice, essentially faulty. My statements may appear bold, but I come prepared to prove them in a manner which I think none of you will question, as the matter admits of the simplest demonstration. I will, in the first place, boil a specified quantity of water in a flat-bottomed vessel of copper; the time required to boil this you will be able to take for yourselves, as the result will be visible by the discharge of a strong jet of steam from the boiler. I will then take another copper boiler of the same form, but with only one-half the surface to give up its heat to the water, and will in this vessel boil the same quantity of water with the same burner in a little over one-half the time, thus about doubling the efficiency of the burner, and increasing the effective duty of the heating surface fourfold, by getting almost double the work from one-half the surface.

The subject is a comparatively new one, and my experiments are far from complete on all points, but they are sufficiently so to prove my case fully. As no doubt you are all aware, it is not possible to obtain flame contact with any cold, or comparatively cold, surface. This is readily proved by placing a vessel of water with a perfectly flat bottom over an atmospheric gas-burner: if the eye is placed on a level with the bottom of the vessel a clear space will be seen between it and the flame. I cannot show this space on a lecture-table to an audience, but I can prove its existence by pasting, with flour paste, a paper label on the bottom of one of the boilers, and exposing this to the direct impact of a powerful burner during the time the water is being boiled, and you will see that it comes out perfectly clean and uncoloured. Now it is well known that paper becomes charred at a temperature of about 400° F., and the fact that my test-paper is not charred proves that it has not been exposed to this temperature, the flame being, in fact, extinguished by the cooling power of the water in the vessel. I need

hardly remind you that the speed with which convected or conducted heat is absorbed by any body is in direct ratio to the difference between its own temperature and that of the source of heat in absolute contact with it ; and therefore, as the source of the heat taken up by the vessel is nothing but unburnt gases, at a temperature below 400° F., the rate of absorption cannot, under any circumstances, be great, and the usual practice is to compensate for this inefficiency by an enormous extension of surface in contact with the water, which extension I will prove to you is quite unnecessary. You will see I have here a copper vessel with a number of solid copper rods depending from the lower surface ; each rod passes through into the water space and is flattened into a broad head, which gives up its heat rapidly to the water. My theory can be stated in a few words : The lower ends of the rods, not being in close communication with the water, can, and do attain, a temperature sufficiently high to admit of direct flame contact, and as their efficiency, like that of the water surface, depends on the difference between their own temperature and that of the source of heat in absolute contact with them, we must, if my theory is correct, obtain a far greater duty from them. I do not, of course, profess to obtain more heat from the fuel than it contains, but simply to utilise that heat to the fullest possible extent by the use of heating surfaces, beyond comparison smaller than what have been considered necessary, and to prove not only that the heating surfaces can be concentrated in a very small area, but also that its efficiency can be greatly increased by preventing close water contact, and so permitting combustion in complete contact with a part of the heating surface. I will now boil 40 ounces of water in this flat-bottomed copper vessel, and, as you will see, sharp boiling begins in 3 minutes 15 seconds from the time the gas is lighted. The small quantity of steam evolved before this time is of no importance, being caused partly by the air driven off from the water and partly from local boiling at the edges of the vessel, owing to imperfect circulation. On the bottom of this vessel is pasted a paper label which you will see is untouched by the flame, owing to the fact that no flame can exist in contact with a cold surface.

I will now take this vessel, which has only one-half the surface in contact with the water, the lower half being covered with copper rods, $\frac{3}{16}$ -inch diameter, $\frac{1}{2}$ -inch centres apart, and $1\frac{1}{2}$ -inch

long, and you will see that with the same burner as before, under precisely the same conditions, sharp boiling takes place in 1 minute 50 seconds, being only 13 seconds more than half the time required to produce the same result with the same quantity of water as in the previous experiment. Although the water surface in contact with the source of heat is only one-half that of the first vessel, and the burner is the same, we can see the difference not only in the time required to boil the 40 ounces of water, but also in the much greater force and volume of steam evolved when boiling does occur. With reference to the form and proportions of the conducting rods, these can only be obtained by direct experiment in each case for each distinct purpose. The conducting power of a metallic rod is limited, and the higher the temperature of the source of heat the shorter will the rods need to be, so as to insure the free ends being below a red heat, and so prevent oxidation and wasting. There are also other reasons which limit the proportions of the rods, such as liability to choke with dirt and difficulty of cleaning, and also risk of mechanical injury, in such cases as ordinary kettles or pans; all these requirements need to be met by different forms and strengths of rods to ensure permanent service, and by substituting in some cases a different form and type of heat conductor. To prove my theory as to the greater efficiency of the surface of the rods in contact with the flame as against that in direct contact with the water, I have another smaller vessel which, including the rods, has the same total surface in contact with the flame, but only one-third the water surface as compared with the first experiment. Using again the same quantity of water and the same burner, we get sharp boiling in 2 minutes 10 seconds, being an increase of duty of 50 per cent., with the same surface exposed to the flame. The rods in the last experiment form two-thirds of the total heating surface, and if we take, as I think for some careful experiments we may safely do, one-half the length of the rods to be at a temperature which will admit of direct flame contact, we have here the extraordinary result that flame contact with one-third of the heating surface increases the total fuel duty on a limited area 50 per cent. This really means that the area in contact with flame is something like six times as efficient as the other. If you will take two ordinary metal ladles for melting lead, cover the lower part of one of these with the projecting rods or studs and leave the other plain, you will find on melting a specified

quantity of metal in each that the difference in duty between the two is very small. The slight increase may be fully accounted for by the difference in the available heating surface reducing the amount of waste heat passing away, and this proves that flame contact, and therefore quick absorption of heat, takes place on plain surfaces as soon as these are above a certain temperature, which, in a metal ladle, very soon occurs. What the temperature is which admits of flame contact I have, as yet, not been able to test thoroughly, and it will need some consideration how the determination of this is to be correctly made; at the same time it is a question in physics which should be capable of being answered.

When we come to boilers for raising steam, which have to stand high pressures, we come to other difficulties of a very serious nature, which require special provision to overcome them. I have found that rods or points, such as I have described, are not necessary, and that the same results can be obtained by webs or angle-ribs rolled in the plates. My experiments in this direction are not complete, and at present they tend to the conclusion that circular webs, which would be of the greatest efficiency in strengthening the flues, are not so efficient for heating as webs running lengthwise with the flue, and in a line with the direction of the flame.

I will now show you as a matter of interest in the publication of coal gas as a fuel how quickly a small quantity of water can be boiled by a kettle constructed on the principle I have described, and to make the experiment a practical one I will use a heavy and strongly-made copper kettle which weighs $6\frac{1}{2}$ lbs., and will hold when full one gallon. In this kettle I will boil a pint of water, and, as you see, rapid boiling takes place in 50 seconds. The same result could be attained in a light and specially-made kettle in 30 seconds, but the experiment would not be a fair practical one, as the vessel used would not be fit for hard daily service, and I have therefore limited myself to what can be done in actual daily work rather than laboratory results, which, however interesting they may be, would not be a fair example of the apparatus in actual use at present.

REMOVAL OF THE ENTIRE LOWER JAW BY THE MOUTH FOR ACUTE NECROSIS,

*Under the care of Prof. ANNANDALE, at the Edinburgh Royal Infirmary,
and reported in the "Lancet."*

WE are indebted to Mr. Reginald E. Horsley, M.B., C.M., house-surgeon, for the following notes (by permission of Professor Annandale):—

H. H—, aged seven, was admitted on Nov. 16th, 1885, suffering from great swelling of the face, and suppuration in connexion with the lower jaw. With the exception of an attack of croup and measles, the latter two years ago, the patient had enjoyed excellent health up to the date of the present attack, which began about ten days previous to admission, the child being at the time apparently in the soundest health. The family history is in every sense good, nor is there any record on either side of scrofula or syphilis. The present attack commenced with acute pain in the region of the last molar tooth on the right side of the lower jaw—*i.e.*, the second molar of the first dentition, which, in common with its fellow of the opposite side, was carious. On Saturday, Nov. 7th, swelling in the region of the tooth mentioned was observed by the father, and two days later the patient, being seized with a rigor and suffering intense pain, became so feverish that he was obliged to remain in bed. On this day the swelling in the gum was noticed to have increased, and three days later burst into the mouth, discharging much pus. Next day, the patient's condition becoming more and more serious, a medical man was called in for the first time. The tissues of the gum were now freely incised, and more pus escaped. On the following day, Nov. 14th, one week from the (observed) commencement of the attack, the father noticed a large portion of the lower jaw exposed, and the doctor extracted the two carious molars. Two days later, the lower incisors, being loose, were also extracted, while several other teeth dropped out. The child was then brought to the infirmary.

State on admission.—The lower part of the patient's face was much swollen, the soft parts over the lower jaw being red and glazed in appearance, and extremely tender to the touch. A most offensive discharge of fetid pus and blood oozed continuously from the corners of the mouth. Thorough examination of the jaw was

difficult, owing to the swelling and tenderness, and to the fact that the mouth could not be fully opened. The temperature was 100.6° . The same evening the patient was very restless and complained of great pain.

Nov. 17th.—Temperature in the morning 101.6° ; rose in the evening to 104.6° . There was much drowsiness; the offensive discharge continued to ooze from the mouth. The treatment consisted of warm fomentations externally, and frequent syringing and washing of the mouth with dilute Condy's fluid.

18th.—Morning temperature 103.2° ; evening, 103.4° .

19th.—Morning temperature 105° . The patient being under the influence of chloroform, Professor Annandale made a thorough examination of the inside of the mouth, with the result that the entire lower jaw was found to be necrosed, its whole periosteum separated, and its connection with the surrounding parts only maintained by some portions of the ligaments at the articulations. These ligamentous attachments being easily separated with the finger, the entire lower jaw, in one complete piece, was drawn out at the mouth, without any cutting or further procedure. Some slight oozing followed the removal of the bone, but this was soon stopped. In the evening the temperature had fallen to 100° , and the patient was comparatively easy.

20th.—Patient decidedly better. Morning temperature 99.4° ; evening, 102° .

21st.—Morning temperature 102.4° ; evening, 101.6° . Patient complained much of pain in the region of the right ear, from the external meatus of which fetid pus was seen to ooze. Slight diarrhœa.

22nd.—Morning temperature 102.2° ; evening, 102° . Patient very restless, and much weaker. The discharge from the ear and the diarrhœa continued and increased.

23rd.—Patient much worse. Hæmorrhage from the mouth controlled by a styptic. In the evening he became delirious, with all the symptoms of meningitis.

24th.—The patient died, his symptoms having become gradually worse.

Post-mortem appearances.—No necropsy was authorised, but examination of the mouth after death revealed an intense and well-nigh complete disorganisation of the gums and soft textures on the floor of the mouth in immediate proximity to the position of the jaw.

The periosteum was swollen and puffy, and in no part that could be felt was there any sign of an attempt to regenerate bone. The contour of the face was preserved. Examination of the jaw itself showed it entirely necrosed throughout its whole thickness. None of the teeth were present, all having dropped out or been extracted. On the left side the germ of the permanent molar was seen.

Remarks.—The interesting features of the case are—(1) the rapid and complete necrosis of the entire lower jaw without any apparent cause; and (2) the removal of the jaw, whole and unbroken, through the mouth. With respect to the latter point, the case is probably unique, no instance having been yet recorded of removal of the entire jaw through the mouth without incision or division of the jaw. There are certainly a few instances on record in which, after division of the symphysis, the jaw has been removed in halves, and other cases have been published in which considerable portions of the entire thickness of the jaw have been drawn through the mouth. Here, however, though the patient's mouth was by no means large, the jaw being carefully separated from its ligamentous attachments, was gently rotated, so as to permit the articular ends to be drawn alternately through the mouth. As regards the first point, it may be remarked that, while necrosis of the lower jaw, as the result of phosphorus-poisoning or some inflammation of a semi or entirely chronic nature, is not without a place in the history of affections of this bone, total destruction of the entire substance in so short a space of time as twelve days or less from the first noted commencement of the disease is sufficiently rare to be worthy of note. Not the least interesting feature, too, in the case is the apparent absence of any cause, or, at least, of any of the more usually recognised causes of necrosis. The most careful questioning failed to elicit any history of injury or cold, though, of course, either may have acted in originating the disease, and escaped notice in the consideration of the disease itself. Erichsen (vol. ii., p. 577), while enumerating the ordinary causes of necrosis of the lower jaw—blows, salivation by mercury, syphilis, and phosphorus poisoning—does at the same time admit that he has “seen the disease occur idiopathically in otherwise healthy subjects without any assignable cause.” There is, it is true, a history of carious teeth, and the transition from caries of the teeth to alveolar periostitis and thence to necrosis of the jaw is a not infrequent one, but this state of things seems most usually

to co-exist with a strumous or scrofulous state of the constitution, and in the present case there is no record of such morbid state. Careful examination, however, yields two or three facts which are interesting, even though among them the real force which set the machinery of disease in motion be not discovered. Heath, in his work on *Injuries and Diseases of the Jaws* (chap. viii., p. 118), remarks, in speaking of necrosis, that "any ulcerative affection of the mouth may lead to necrosis of the jaw." Now the patient's father stated that the child had drunk from a wayside horse-trough in the village, and suggested blood-poisoning by means of a glandered horse. Glanders certainly affects the mouth in common with the rest of the respiratory tract, but there is no evidence to show that glanders and necrosis of the jaw can be regarded as cause and effect, putting aside the fact of the absence of other symptoms of this form of blood-poisoning. The question then arises: Could the disease have originated in some inflammatory action, leading to ulceration of the tissues of the cheek, and ultimately spreading to the alveolar periosteum? No evidence of any such condition exists. Indeed, the evidence is all in the opposite direction. The swelling of the face, which was certainly great, was subsequent to the severe pain (toothache) in the jaw; and the so-called gumboil, noticed by the father, was situated on the inner side of the gum, and not in apposition to the cheek. There remains yet to be considered the question of the cutting of a tooth of the second dentition; and here a ray of light, if a feeble one, seems to fall upon the case. It will be remembered that the germ of the permanent molar was seen in the jaw, and in connection with this point the following remarks from Wedl may be quoted:—"Periosteal inflammations occurring during the period of dentition are of special importance, since, with children, inflammatory affections generally run a more rapid course than with older people, particularly in an organ in which development takes place within small limits with comparative rapidity. The more extensive the infiltration of the maxillary periosteum, the greater is the danger that a larger portion of the jaw will become necrosed. Children of a scrofulous or tuberculous habit are more liable to the occurrence of necrosis of the jaws, from the fact that in them the infiltration undergoes a speedy degeneration on account of the rapid proliferation of the elementary organs."

Tomes also points out the occurrence of necrosis of the jaw

during the period of dentition, particularly where a decayed tooth exists in the mouth and the child is of a scrofulous diathesis. Heath, too, remarks (*loc. cit.*) that "acute periostitis of the jaw may arise in young subjects from the cutting of the permanent teeth." Summing up, then, the facts presented, we have:— (a) Absence of usual causes; (b) absence of inherited scrofula; (c) presence of carious teeth; (d) appearance of first molar of second dentition. It is probable, then, that the cause of this interesting case may be found in the fact that the usual inflammation consequent on the cutting of a tooth passed to and affected the carious molar of the first dentition; that so alveolar periostitis was set up, leading to extensive necrosis of the lower jaw. But since most leading authorities lay stress upon the presence ordinarily of some constitutional taint, and since, as Erichsen (vol. i., p. 1061) points out, scrofula not necessarily inherited "most commonly declares itself about the period of the second dentition," it is equally possible to admit that a scrofulous taint, unsuspected and hitherto undeclared, lent itself to the development of a disease which, notwithstanding the presence of carious teeth of the first and the conjoint cutting of a tooth of the second dentition, might otherwise never have ensued.

BORIC ACID AND AFFECTIONS OF THE MOUTH.

By A. D. MACGREGOR, M.B., C.M.

Abstract from the "British Medical Journal," July 10.

IN connection with the local application of boric acid in various diseased conditions of the mouth, its solubility in water and glycerine, its unirritating character, its comparatively innocuous nature, and its almost tastelessness, are greatly in its favour. More particularly is this the case in treating such conditions in children, whose oral cavities cause them so much annoyance. Speaking generally, boric acid will be found useful in all conditions of the mouth, fauces, pharynx, and nose, where there is any abrasion of the epithelium; whether it be used as a powder, gargle, mouth-wash, pigment, or confection. More definitely, I may say, it is not contradicted in any of the forms of *stomatitis*, though scarcely severe enough for the graver varieties.

IN SIMPLE CATARRHAL STOMATITIS, a mouth-wash containing from 10 to 15 grains to the fluid ounce speedily cures the condition,

and exercises the same beneficial influence in the *ulcerative* form, though there, in addition to the rinsing of the mouth, a local application in the form of powder or pigment should be made to the individual follicular ulcers. The powder simply consists of finely powdered boric acid, mixed in various proportions with starch: the pigment is a solution of boric acid in glycerine (1 in 4 or 5). In both cases, the addition of chlorate of potassium is advantageous; indeed, I usually combine it, but it is not essential.

For thrush in children, I especially recommend boric acid, either as a mouth-pigment or as a confection. Honey and sugar have both been condemned, as being inadmissible, in combination, for the treatment of thrush: but, so far as children are concerned, I must say I consider a confection (though made with honey), which has been impregnated with boric acid, gains more by its palatableness than it loses by the tendency of the saccharine matter to further the growth of the fungus. The boric acid at once does away with this tendency. Let the pigment be frequently painted with a brush over the patches, never omitting to do it after food has been taken; or, a little of the confection, simply allowed to dissolve in the mouth; and the days of the fungus will soon be ended. I have found boric acid, combined with its salt (borax), markedly beneficial. Borax alone, however, is not nearly so good.

IN PHARYNGITIS AND RELAXED CONDITIONS OF THE THROAT, a gargle, containing boric acid and glycerine, with either tannic acid or alum in addition, ought not to be forgotten.

In severe cases of typhoid fever the mouth is frequently hot; the lips dry, cracked, and glued to the sordes-covered teeth by inspissated mucus and saliva; the tongue dry, or even glazed and hard, brown or black, crusted with a foetid fur. Under such circumstances, a pigment, containing boric acid (30 grains), chlorate of potassium (20 grains), lemon juice (5 fluid drachms), and glycerine (3 fluid drachms), yields very comforting results. When the teeth are well rubbed with this, the sordes quickly and easily become detached; little harm will follow from the acid present. The boric acid attacks the masses of bacilli and bacteria; the chlorate of potassium cools and soothes the mucous membrane; the glycerine and lemon juice moisten the parts, and aid the salivary secretion.

A tooth powder should possess certain characteristics: it

should be antiseptic, cooling, agreeable to taste and smell, and have no injurious action on the teeth. After use it should leave the teeth white, and a sensation of freshness and cleanliness in the mouth. As an antiseptic in this connection nothing can replace boric acid. For years I have used the following powder, and can recommend it :—

Boric acid, finely powdered	..	...	...	40 grs.
Chlorate of potassium	...	...	...	3ss.
Powdered guaiacum	...	...	...	20 grs.
Prepared chalk	...	...	...	3i.
Powdered carbonate of magnesia, to	...	...	...	3i.
Otto of roses	...	...	...	half a drop.

The boric acid in solution gets between the teeth and the edges of the gums, and there it discharges its antiseptic functions ; the chlorate and guaiacum contribute their quota to the benefit of the gums and mucous membrane generally ; the chalk is the insoluble powder to detach the particles of tartar which may be present ; and the magnesia the more soluble soft powder which cannot harm the softest enamel.

DENTAL HOSPITAL OF LONDON.

THE distribution of prizes and conversazione of the Students' Society in connection with this School took place at the Marlborough Rooms, Regent Street, on Tuesday evening, July 20th. Mr. JAMES SMITH TURNER occupied the chair.

The DEAN did not present a report, but announced that the School was progressing satisfactorily.

PRIZE LIST.

Saunders' Scholarship—Mr. H. Williams.

Mechanical Dentistry—1st Prize, Mr. H. J. Moore ; 2nd Prize, Mr. H. Williams ; Hon. Certificates, Mr. F. M. Ludbrook, Mr. A. T. Croucher.

Metallurgy—1st Prize, Mr. H. Williams ; 2nd Prize, Mr. F. M. Ludbrook ; Hon. Certificates, Mr. H. J. Moore, Mr. A. E. Baker.

Operating Prize—Prize, Mr. J. F. Colyer ; Hon. Certificates, Mr. G. O. Whittaker, Mr. A. Kendrick, Mr. A. T. Croucher.

Dental Anatomy—1st Prize, Mr. H. Williams ; 2nd Prize, Mr. J. Moore ; Hon. Certificates, Mr. A. E. Baker, Mr. F. M. Ludbrook, Mr. A. W. Frost, Mr. G. H. Badcock, Mr. J. S. Acton.

Dental Surgery—1st Prize, Mr. A. E. Baker ; 2nd Prize, Mr. F. M. Ludbrook ; Hon. Certificates, Mr. H. J. Moore, Mr. H. Williams. Mr. A. W. Frost, Mr. W. A. Hooton.

Ash's Prize—Mr. A. T. Croucher.

Students' Society's Prize—Mr. C. A. Barstow.

Having distributed the prizes, Mr. J. SMITH TURNER delivered a somewhat lengthy address, which we have epitomised as follows : Ladies and Gentlemen—In such an assembly and upon so interesting and important an occasion as this, I think I may assume that there is a very healthy tone pervading the School of Dental Surgery in Leicester Square ; I think when the students make the annual distribution of prizes not merely a matter of interest, but a red-letter-day in their calendar, then it shows a healthy enthusiasm, a proper emulation, and that they are working well together.

Such an occasion as this enables the student and the lecturer to meet on common ground ; it enables them to meet together in a different aspect. In the lecture room one talks and the others listen, here we interchange ideas ; and therefore I have great pleasure in being here this evening. It also enables the prizemen to receive what is even of more value than the prizes—the congratulations of their fellow-students, and it is a good thing to think that they are of spontaneous origin, arising from feelings of genuine goodwill. And when the students openly congratulate their successful competitors it shows that they have the true English hearts beating within them, ready to acknowledge a defeat, and the moral courage to begin again.

To the successful students to-night I would venture to say one word. You must not rest contented with what you have done ; you have achieved a reputation, and it is incumbent upon you to maintain that reputation. If ever this bud of promise, which looks so fair to-night, should be blighted, you may rely upon it that this meeting will come up before you to reproach you.

To those who have been unsuccessful I would say, You are still young, and your lives are still before you ; that the pressing forward to obtain the prize, though you should not succeed, is a distinct gain to you ; that you have time before you, and you may be sure of this, that steady and constant attention to duty will sooner or later bring its reward.

You are, gentlemen, entering upon a profession which is, comparatively speaking, still in its infancy ; those gentlemen who

have raised it to its present pedestal of scientific knowledge and practical utility are still with us, and it will be for you, gentlemen, by your conduct, by your zeal, by the way in which you safeguard the good name which is bequeathed to you by those who put confidence in you, to enhance the value of the profession daily in the estimation of the public. And I will venture to say that if you give proper attention to the matter, the public will, before you close your career, begin to understand that dentists are educated gentlemen.

From what we hear from the Medical Council, and the reports which come to us, it is obvious that the dental education is far from a settled one. Take the preliminary education, to begin with. That might seem to be thoroughly settled, and we know that the dental student has to go through the same preliminary examination as the medical student, and some think that we ought to be content with this.

There is one point we ought not to forget: that of late years there has been a very pronounced feeling against classical education, but it seems to me that whilst we give the rising generation a more or less scientific education, we nevertheless do not wish to make them pure scientists; we wish to make them practical professional men. Now it is very difficult to define a professional man, it is very difficult to define professional feeling; it is one of those things which we *feel*, like many other things, and which we *believe*, like many other things, but it is very difficult indeed to define. Speaking broadly, I would say that the professional man is he who thinks the interest and welfare of his client as paramount and his own interest as secondary; then he will also, because imbued with this professional feeling which is so undefinable, be very careful how he is influenced by the conduct of his professional brethren; be careful to be guided by the unwritten code of professional honor. He will be very careful how he judges of the work of his professional brother, unless he knows the circumstances which induce him to follow a certain course of procedure. Now, I do not think that science alone is likely to produce men of this stamp; generally speaking, I believe culture alone would do it; but I look for a "judicious mixture" to bring about the best results. It has seemed to me very remarkable that the gentlemen who seek to set aside classical education have themselves been very much favored in this particular; they seem

to have had a very fair share of that classical training which they so much decry. It may seem to you, however, that this makes their opinion of considerable weight and authority; that their having had a scientific and classical education combined gives them an authority not to be gainsaid. I think otherwise: I think they do not know the want of a classical education; they have used it unconsciously and do not appreciate it at its proper value. For my own part I regret to say that I have had such a very meagre portion of that classical education which I advocate that I feel the want of it, and it is perhaps in some measure because of this that I am induced to speak of it to-night.

Turning more closely to our own profession, you know it has almost become a truism that if you become a specialist you become narrow-minded—perhaps it would be nearer correctness to say that the profession of a specialist would produce a narrow mental habit, a narrow way of looking at things. But I do not think that among all the professions any one of them can show the same cogency for being studied and followed as a specialty as the profession of dentistry, and, therefore, I think we are more likely to suffer from the narrow-minded habit of thought to which I have referred; hence the necessity of a liberal education. To follow out and successfully master the profession of a dentist requires an immense amount of ingenuity and physical exertion, and I believe that to acquire the skill to follow this art with success we have to give more time than is necessary in the acquisition of the skill to perform some of the highly-paid operations in the higher walks of surgery; but I cannot admit for a moment that this leads to the development of a powerful intellect. While I do not decry the art of stopping teeth, I do not think it is conducive to great mental development, and therefore I would again urge the desirability of culture, both classical and scientific. We were all immensely pleased a short time ago to know that Her Majesty had selected a gentleman from our ranks to receive high social honours, and on that occasion he was selected mainly because of his scientific and general attainments. I think also, if we look around us, we shall find that very high scientific honours have been gained by the members of our profession: that many of our members are also members of the Royal Society and other learned and distinguished bodies.

Ladies and gentlemen, it is now getting near the time for you

to adjourn to something more melodious than my musical voice and something more entertaining than I can give you. Those of the profession here to-night know that there are many subjects which I might mention, but which it would be impossible to deal with adequately in anything like the limits of time allotted to me, or without wearying you; those outside the profession will see that we are not allowing the profession to develop in a haphazard manner; and though we cannot offer to you the allurements of the advertising charlatan, this we can at least show you, that we are devoted to the amelioration of pain and the comfort of the public generally.

Sir EDWIN SAUNDERS, in a few appropriate sentences, proposed a vote of thanks to Mr. Turner for having so ably and so genially presided on the occasion.

Mr. TURNER briefly responded, after which the company adjourned to the concert-room, to listen to the following programme, when the proceedings were brought to a close.

THE BRITISH DENTAL ASSOCIATION.

SOUTHERN COUNTIES' BRANCH.

THE first meeting of the Southern Counties' Branch of the British Dental Association took place at Brighton, on Saturday, the 24th ult. The Council assembled for private business in one of the Mayor's parlours, at the Town Hall, at noon. There was a luncheon at half-past one at the "Old Ship" Hotel, to which the members and visitors were invited, and at three o'clock a general meeting, which was largely attended by visitors as well as members, was held at the Town Hall. The President of the branch, Alderman S. L. RYMER, J.P., took the chair.

The HON. SECRETARY read the minutes of a meeting held in May last, and, in conclusion, moved that Croydon be the place of meeting for next year, and that Alderman Rymer, J.P., be the President-elect.

Councillor W. R. WOOD, sen., seconded, and the motion was put and carried amidst loud applause.

The PRESIDENT next rose, amidst applause, to deliver his inaugural address. He said:—Gentlemen,—Placed in the dignified position of first President of the Southern Counties' Branch of the British Dental Association, by your kind will, allow me to

offer my grateful acknowledgments for so distinguished a favour—the more valued, if possible, from the fact that it is by a unanimous request that I find myself thus honoured. At the same time, there are circumstances which should have indicated another as more fitted than myself, in such capacity, to advance the life of our new offspring, which circumstances I pointed out when the office was placed at my disposal in the first instance; but the objections not being regarded as vital, and a desire unmistakeably expressed that I should accept the chair, I felt that it would be wanting in appreciation on my part to decline the distinction. Then, again, being associated with so excellent and representative a Council and officers, including such a Vice-President as the veteran Wood, I don't think that I ought to entertain any doubt as to the happy result of our inaugural and subsequent proceedings. The Southern Branch, it must be owned, is later of birth than might have been expected—a fact to be traced to exceptional causes, which need not be dwelt upon. Suffice it to say that we now see our way clearly to the necessity of organisation in these parts, that good men and true have been found ready to take all the initiatory steps, and that we are here assembled as a recognised and actual living branch of the parent association, having been received, as I can personally testify, into that vigorous body with expressions of the utmost sympathy and cordiality. To refer individually to those who have locally contributed to this position might be regarded as invidious, but there is one name which cannot be passed over, because we owe our very being, as a branch, to his zealous action—I allude, of course, to our esteemed Honorary Secretary, Mr Dennant, to whom our warmest thanks are so justly due. Allow me now, gentlemen, to pronounce the word “Welcome” to all present, and to express an earnest hope that we who are members may long live in these fair counties of Hampshire, Kent, Surrey and Sussex, continually knit together for the advancement of our common calling—a calling, happily, recognised by law and by society as a scientific profession of indispensable utility. If we do not commence operations with a very extended list of members, we have, at least, the satisfaction of knowing that the names are thoroughly representative, comprising some of the best known in the profession, and I am proud to be enabled to congratulate the branch that it has the distinguished honour of reckoning upon its earliest enrolment the name of John Tomes, whose residence is

fortunately within our boundaries, thus at once shedding a lustre upon the Southern Branch. The services of John Tomes—scientific, political and administrative—no less than his personal worth, are gratefully acknowledged by us as a profession; therefore it is but natural that we should rejoice upon learning that our own well-understood recognition has extended beyond merely special limitation, and that Her Most Gracious Majesty, acting with characteristic discretion in the scanty distribution of royal honours at her disposal amongst professional men, has seen fit to confer a knighthood upon one so entirely worthy, and that now and from henceforth—and, I hope, for many a long day to come—we shall hail that one as “Sir John Tomes.” Commenting upon this notable event, the *British Medical Journal*, of June 5th last, says:—“Mr. John Tomes has, throughout his successful career, held an unique position of scientific attainments and administrative capacity. To no man is dentistry in this country more indebted for the elevation of its professional status, nor has any one taken a more important and useful part in promoting educational and legislative reforms which have, of late years, established the dental profession on its present high platform. Mr. Tomes has for some years retired from practice. The honour now conferred upon him will dignify his retirement. It marks justly the great service which he has rendered.” These remarks are so much to the purpose that I have felt constrained to quote them. To Sir John himself the distinction is of small moment; yet, as marking in the highest quarters the rising importance of the dental art, it is a matter of gratifying significance, especially as it is a second instance of such recognition by the Sovereign. Within a comparatively short time, as I need scarcely remind you, a similar honour was conferred upon a highly accomplished dental surgeon, whose services to Her Majesty, no less than to the profession at large, are well known. In Sir Edward Saunders we recognise the munificent supporter of every good work in our midst—scientific, social and charitable—public as well as private. I am quite sure that his heart is with us in the object we are here striving to accomplish, and it is worthy of remark that his residence at Wimbledon is also within the lines of our branch. Under the genial presidency of Sir Edwin Saunders the British Dental Association will hold its annual meeting in the metropolis within a few weeks, an occasion we are looking forward to with pleasure as one of even more than

usual interest. I may mention, in passing, that I have purposely avoided dwelling upon the recent work of the Association, because this will be submitted to the members in detail at the London meeting, under proper authority, and no doubt the record will prove particularly valuable, especially in regard to the recent legislative action affecting the profession. Starting our branch, then, thus favourably, and in contemplation of the important character of so many towns within the southern district, we have good reason to look forward for support to a large and influential constituency, to be locally banded together with the intention of assisting to carry out the aims of the British Dental Association, which aims may be summarised as meaning a steady and progressive action towards the attainment of sound professional status under the provisions of the "Dentists' Act." The aims are further directed towards bringing men periodically together in social companionship and scientific conference, thus producing a personal sympathy otherwise unattainable. The general result of all proceedings is focussed in the excellent journal of the Association, and brought home to each member. To guide us in proceedings with our new undertaking we have the advantage of the experience of the parent society, as well as of its already existing branches, for which we must feel indebted. At the same time we shall endeavour to develop new ideas towards the common end. Independently of duty of keeping a watchful eye upon the Dentists' Register, there are many points to engage attention—as, for instance, the best means of influencing fellow-practitioners who are deserving of consideration, and yet cannot be regarded as conducting practice with strict decorum, in some cases from quite mistaken notions. There are not a few such men, and it is worth some trouble to bring them into the fold. As to those minus conscience, and who possess no *amour propre*, it would, of course, be mere waste of time to endeavour to move them. Such pests must be allowed their time of discredit before their final disappearance. Then, another subject which presents itself as a difficult problem for solution is as to honourable ways and means of establishing a reputation, affecting especially, practitioners commencing life. In the course of his most able and interesting inaugural address at the annual general meeting of the British Dental Association, held at Cambridge last year, Mr. White, the esteemed President, pointedly referred to this subject, expatiating upon the difficulties

experienced by the recently qualified dental surgeon, whose desire was to depend only upon a true professional basis, commencing life as he does under greater disadvantages than he would in any other profession. Going on at length to demonstrate the embarrassments of a beginner, Mr. White says :—" It is easy to imagine the feelings of a young dental surgeon who has been industrious in the pursuit of professional knowledge, and has passed the necessary examination for the dental license, when he sees patients consulting advertising charlatans, whilst he for days together is waiting for those who do not come, and brooding over his position, feeling that he cannot resort to those measures to make himself known which these unqualified persons revel in, and by means of which, in many instances, they accumulate considerable wealth." Without pausing to dwell upon the past and present difficulties of beginners, which are important primarily as presenting a topic for future consideration, it here becomes convenient to refer briefly to the question of demand and supply. In a word—Is the profession overstocked? So far as I am able to judge from a careful survey of the situation, the answer should be in the negative. There appears to be ample work for all its legitimate members, although it may not, perhaps, be so equally divided as one would desire. The vacant places of those who, from time to time, retire from active practice, or drop out of the ranks from other causes, are filled up as they occur, and the increasing demand for the services of the dental surgeon are just about met by the number of men (now well qualified) who are being sent out into the field of practice under the system of legal authority which prevails. I believe there is plenty of scope for all these, and, moreover, it will be found presently that the information disseminated by such an institution as the British Dental Association, and its development, will have the effect of awakening people of all grades to the immense importance of paying that due attention to the teeth which is known to those who study the laws of nature to be an essential element in regard to sound health and long life. None are more alive to this truth than medical men, who, speaking generally, are at one with us in desiring to see the advantages of recent legislation applied with all convenient speed towards securing to the public service only honourable men of good qualification. "Rome was not built in a day," neither may so desirable a consummation be expected all at once, but we

believe in it. In the meantime, no effort should be lost in providing for a more complete education of the public mind in this direction. A shaking of the dry bones of indifference is already distinctly apparent amongst the laity, and I hope that we may all live long enough to see throughout the British dominions a general awakening to the fact that the teeth are organs of too much value to be neglected by the people, whether of "classes" or "masses." With these signs of the times before us, it may be prophesied that skilled aid is destined to be in such demand as to call for a largely increased body of practitioners for private as well as for hospital duty, so that we should see to it that our collegiate machinery shall be of sufficient capacity and strength to meet all prospective requirements.

But to return to the trials of our friends—the newly qualified. Mr. White, in his address already quoted, lays considerable emphasis upon the remedial effects likely to arise from a multiplication of dental hospitals and appointments in the provinces, and, to a certain extent, we may agree with his view of the case; but I am inclined to the opinion that the benefit would not be so distinct as he imagines, because, after all, the number of such institutions, for a long time to come, will necessarily be of limited extent, and, indeed, much circumspection is needed in their establishment, otherwise they are capable of perversion; not that I desire for a moment to throw cold water upon the extension of these most useful charities, but I doubt whether the bulk of recently qualified men will find their portals sufficiently wide to permit of introduction to public favour in that way, although the appointments are, in themselves, worthy of ambition. The advantages of membership with the Association, as it appears to me, and as also referred to by Mr. White, are more likely to prove of real assistance towards the object sought to be attained, and the greater its extension in area, as well as in point of numbers, the greater will be the power of combined action—the benefit of which should be especially experienced by those who require a fraternal hand. It is a perfectly legitimate and commendable course for those connected with the Association to do all that in them lies to help one another. As matters stand, we often find that our friends far away take care to inform patients who are removing to other localities as to whom in those "pastures new" they may safely confide in time of need, thus often saving them from the malprac-

tices of advertisers, whose glaring announcements and presumption so frequently entrap the unwary, and before the poor dupes become alive to the fact that

“The truest characters of ignorance,
Are vanity, and pride, and arrogance.
As blind men used to bear their noses higher,
Than those that have their eyes and sight entire.”

It would, perhaps, be a convenient arrangement for each member of the Association to have ready at hand a list of members for easy reference. Withal, the young practitioner will have to depend mainly upon his own resources rather than upon others. The first requirement is a determined will to succeed, and never to be absent within reasonable hours from the post of duty. Waiting may seem irksome, but the mind can always be employed profitably by the cultivated in the interim, and when once work does come, and is thoroughly well done, it recommends itself, and the operator meets his just reward. To the conscientious beginner, no less than the older hand, nothing can be more abhorrent than any approach to vulgar touting; at the same time, merely trusting to a name-plate on the door and to good luck, will prove disappointing. Fortunately there are means at disposal, and which membership with our Association will render the more easily available, for outside social intercourse in the several societies for the promotion of literature, art, and science, to be found in every centre of importance. Taking part in the meetings of these institutions is sure to prove an extremely congenial and profitable occupation, bringing the aspirant also into direct personal contact with the best intellect of the locality. If he be made of the right stuff, that fact will soon become apparent, and his light need not be hid under a bushel. This question, as opened by Mr. White, struck me as sufficiently opportune to warrant special attention, and I have alluded to it in the expectation that its further consideration will lead to some practical good in the interests of those who are devoting a considerable portion of early life and energy to qualify themselves as professional men of high aspirations; and it is only to such that we can look for the dignified maintenance and elevation of the honourable position already won through the unsparing exertions of those who have gone before.

On the whole, the future outlook may be considered as encouraging, and there is every reason to believe that the

material benefits, which the scientific practice of dental surgery is capable of affording, are becoming more and more appreciated by the public, and that the prospective additional demand for professional services will be responded to by a faculty of sufficient enterprise to meet the requirements. But it must be borne in mind, if there be any reality in the presumption advanced, that increased duties will certainly involve increased responsibilities on the part of dental surgeons, in order to keep well abreast of the times. For the purposes of our specialty the degree of Licentiate in Dental Surgery is sufficient as a qualification to include all ordinary responsibilities, certainly so far as any legal requirements may be concerned. You are, no doubt, aware that in the early days of the dental reformatory movement of thirty years ago, two proposals were placed before the profession in regard to qualification, one in favour of a connection with the existing surgical examining boards, and the other of an entirely independent body, the aim in each recommendation being the same—viz., an examination equal in degree but different in kind to that required for the Membership of the Royal College of Surgeons. After long controversies the former proposal prevailed, and was finally adopted with practical unanimity. What might have happened had the strictly independent principle been adopted, it is impossible to say, and no advantage is now to be derived from mere conjecture; but the L.D.S. qualification does unquestionably indicate that its possessor is one skilled in his specialty. Whilst recognising this fact, and the comprehensive nature of the examination involved, there exists, nevertheless, a feeling in some quarters that the Licentiate suffers by exclusion from certain privileges accorded to the Member, as is particularly exemplified by the ineligibility of the qualified dentist pure and simple for membership of the medical societies. Considering that dental surgery is allowed as a branch of the medical profession, such a condition of exclusiveness hardly seems fair; but, to overcome all difficulties under the circumstances of the situation, my earnest advice to young men entering the profession is to go in for a medical qualification as well as that of dental. The adoption of this method, I am persuaded, will never be regretted, although it involves some amount of extra time, labour and expense. From expressions which have fallen from those best able to judge, it appears clear that, for the time being, we have

enough work already in hand politically in managing the machinery placed at our disposal so recently by the legislature, but if we may be permitted to indulge in hopes for the future, it must be admitted a general compliance with the policy of a double qualification would ensure so complete a fusion as to leave nothing to be desired in that direction. Let it be clearly understood, nevertheless, that the L.D.S. degree must always stand as *the* qualification of the dentist. Only the other day I had the pleasure of listening to an address from that eminent surgeon, Sir William MacCormac, the occasion being the distribution of prizes at the National Dental College. Sir William strongly impressed upon the students then assembled the importance of acquiring the general as well as the special qualification, thus strengthening an opinion I have adopted for years past. The time may possibly arrive when the L.D.S. qualification will only be open to the general student of medicine, and granted in like manner as the L.M.; but I will not longer detain you upon an idea *in nubibus*, although the subject is, to my mind, one of interest and worthy of leisurely thought in reference to the outlook of another generation.

Admittedly rather late in taking the field, the Southern Branch appears to show such a determination on the part of its early members to work it thoroughly that we may anticipate the delay of the past will be fully compensated by future activity and enterprise, so that we shall soon hope to reach the standard of the sister branches, and to become equally worthy offshoots of the parent stem. The constitution and bye-laws, adopted after due consideration, are well suited towards so desirable an end, and will, in that light, commend themselves to our southern constituency. The area of the counties embraced within the district is large, and the Council, unaided, cannot hope to develop its unquestionable resources; but with the influential co-operation which they believe will be cheerfully accorded by friends individually in such places as Hastings, Eastbourne, Portsmouth, Bournemouth, Dover, the Isle of Wight, Southampton, the inland and metropolitan districts south of the Thames, and this great and majestic town of Brighton, in which we are so pleasantly met together to-day, we may surely confidently look forward to a large accession of members from many points of the compass. Thus, with a liberal but just administration of affairs, no worthy brother will have occasion to experience isolation in his vocation

and calling. He will, on the contrary, be enabled for the future to unite with his fellow-practitioners in locally working to strengthen the position of the "British Dental Association" in its laudable objects and beneficent aims.

During the delivery of his address the President was frequently applauded, and at its close the members were most enthusiastic in their demonstrations.

Mr. MORGAN HUGHES, M.R.C.S., L.D.S.Eng., opened a discussion "On a Case of Trismus, caused by dental irritation."

The HON. SECRETARY read a paper by Mr. C. H. Bromley on "Composite Fillings."

Mr. J. H. WHATFORD, L.D.S.Eng., read a paper "On the Treatment of Pyorrhœa Alveolaris," and "A Case of Malignant Disease of the Jaw" was read by Dr. REDMAN, of Brighton.

At the close, the PRESIDENT thanked the readers of papers on behalf of the meeting, and afterwards said those present were greatly indebted to the Mayor and Corporation of Brighton for the use of the rooms at the Town Hall, which had been placed at their disposal.

A vote of thanks was accordingly passed, and the meeting then separated.

In the evening a dinner was held at the Old Ship Hotel, and was attended by about fifty gentlemen, the members of the Branch being joined by several representatives of the medical profession. The President again occupied the chair, and Councillor W. R. Wood the vice-chair.

WESTERN COUNTIES' BRANCH.

The Eighth Annual Meeting of this branch was held at Exeter on the 30th ult., the President, Mr. GEORGE McADAM, L.D.S.Eng., in the chair. There was a good attendance of members.

Mr. J. T. BROWNE-MASON, L.D.S.Eng., on assuming the office of President for the ensuing year, delivered an address, in the course of which he said that he thought the increase in these Branch Associations was a great factor in the spread and growth of the British Dental Association, in support of which he quoted the opinion of Sir John Tomes, who in May last wrote:—"the formation of a branch is surely a sign of advance of our calling upon professional lines. Union for the furtherance of a general purpose, and that purpose professional culture in its widest meaning, is to make open war with narrow views and personal exclusiveness—the

parents of illiberality and greed—to substitute the field glass for the microscope. We are most of us too apt to regard our own immediate surroundings as a general measurement, and thereon proceed to condemn that which, with a wider knowledge of the general subject, we should readily tolerate and perhaps support. The ready cure for this limitation of view and blundering in interpretation is free association with our fellow men of all grades and callings, beginning with those of our own calling.” He (the President) wished the words he had quoted could reach those who, while maintaining their practice on true professional lines, still held aloof from the Society, and refused to extend a hand to assist in raising the status of the profession, and clearing it of many who, by their fraudulent representations, had obtained a place in the dentists’ register. He said “Education” was the best banner under which to raise the general position of the profession, and that could be materially advanced by such meetings as the Association held. He never attended such a meeting without taking back something to the advantage of himself and patients.

The following papers were read:—“Some of the difficulties of Mounting Teeth on the Bar Principle,” by Joseph Walker, M.D., St. And., M.R.C.S., L.D.S.Eng.—“Anæsthetics, General and Local, including Cocaine,” by J. M. Acland, M.R.C.S., L.S.D.Eng.—“The Medical Treatment of Dental Abscess,” by A. C. Roper, M.R.C.S., L.R.C.P.Edin.—“Dental Irritation in relation to Diseases of the Eye,” by Louis Toswill, B.A., M.B.Cantab, M.R.C.S.—“Palladium and some of its Uses and Peculiarities,” by W. A. Hunt, M.R.C.S., L.R.C.P.Lond.—“Regulating Teeth,” illustrated by models, by Geo. B. Pearman, L.D.S.Eng.

In the evening the Annual Dinner was held, the president being in the chair.

ANNUAL MEETING.

The Annual General Meeting of the Association will be held in the Theatre of the Royal School of Mines, in Jermyn Street, London, W., and in the Dental Hospital of London, 40, Leicester Square, on Thursday, Friday and Saturday, the 19th, 20th and 21st inst. The order of proceedings will be as follows:—

Thursday, 9 a.m.—Meeting of Representative Board in the Library of the Royal School of Mines.

10.30—The Annual General Meeting for business (open to members only) will assemble in the Theatre of the Royal School of

Mines. At the termination of the Association business the meeting will be open to visitors. In the absence, from illness, of the President, Mr. Richard White, Sir John Tomes will be in the chair and address the Association.

Sir Edwin Saunders, F.R.C.S., the President-elect, will then take the chair and deliver his Address. Papers will then be read and discussed.

List of Papers promised:—

On Dental Education, by Morton Smale, Esq., M.R.C.S., L.D.S.Eng., L.S.A.; On the Treatment of Alveolar Abscess, by W. Grayston, Esq., L.D.S.I.; A Simple Method of Photo-micrography suitable for the Delineation of Dental and other Tissues, by T. Charters White, Esq., M.R.C.S., L.D.S.Eng.; Dentistry and its Relation to the State, by George Cunningham, Esq., D.M.D.; The Conjoined Diploma in Medicine and Surgery, and its acquirement by Dental Students, by S. J. Hutchinson, Esq., M.R.C.S., L.D.S.Eng.; Compulsory Attention to the Teeth of School Children (second paper), by W. M. Fisher, Esq., L.D.S.Eng.; Public Appointments in Relation to Dental Surgeons and the Methods in which they are Conferred, by W. G. Gordon Jones, L.D.S.I.

Casual Communications will be received after the papers, should time permit.

1 p.m.—Adjournment for Luncheon.

2.30 p.m.—Reading and Discussion of Papers.

5.30 p.m.—Adjournment.

9 p.m.—Conversazione, given by the Odontological Society, in the Rooms of the Medical Society of London, in Chandos Street, Cavendish Square, W.

Friday, 10 a.m.—The Annual Meeting of the Dental Benevolent Fund in the Theatre of the Royal School of Mines.

11 a.m.—Reading and Discussion of Papers continued.

1 p.m.—Adjournment for Luncheon.

2.30 p.m.—Demonstrations and Exhibition of Instruments, &c., in the Dental Hospital of London, 40, Leicester Square, also an Art Exhibition for the Benefit of the Dental Benevolent Fund.

List of Demonstrations promised:—

Gold Filling Non-cohesive, by J. Ackery, Esq., M.R.C.S., L.D.S.Eng.; Gold Filling by the Herbst Method, by W. Storer Bennett, Esq., F.R.C.S., L.R.C.P.Lond., L.D.S.Eng.; Gold

Filling, by W. St. George Elliott, Esq., M.D., D.D.S.; Gold Filling with Electric Mallet, by E. Latchmore, Esq., L.D.S.Eng; Gold Filling with tin combined, by Robert H. Woodhouse, Esq., M.R.C.S., L.D.S.Eng.

6.30 p.m.—Annual Dinner of the Association to be held at the Criterion.

Saturday, 10 a.m.—Reading and Discussion of Papers continued, if necessary.

4 p.m. to 7 p.m.—A Garden Party, given by Sir Edwin and Lady Saunders, at Fairlawn, Wimbledon Common.

The above arrangements may have to be altered, according to the time at the disposal of the Committee.

JOURNALISTIC SUMMARY.

DENTAL COSMOS. (*July, PHILADELPHIA.*)

“FUNCTION: ITS EVOLUTION AND INFLUENCE,” by C. N. Peirce, D.D.S. Having criticised the previous observations of others, the writer gives some illustrations of comparative dental anatomy and concludes:—

In the above, only a few representations of the result of mechanical force are given. If necessary every group of animals, where the teeth have passed beyond the transitional condition, could be cited to render additional evidence, and no individual case would speak more emphatically than the incisors of the rodents, where from persistent pulps the tissues are developed and arranged so that the animal may always be provided with sharp cutting instruments in the anterior part of the mouth.

In summing up the result of the investigation, the following postulates may well represent in a condensed form the substance of the argument—which the writer hopes his friend Dr. Atkinson will not say have been copied from Leidy, Cope, or Marsh.

1st.—That the tendency is to the suppression of organs and tissues not used, and the development of those most used.

2nd.—That the teeth, notwithstanding their density, are, like the more vascular tissues, subject to modification from use and disuse.

3rd.—That the food-habit and cumulative results of heredity have been important factors in shaping tooth-forms.

4th.—That the degree in which teeth are modified from a

simple type is in correspondence with the differences in the degree of resistance to be overcome in the mastication of food.

5th.—That the restriction and limitation of diet has contributed to the specialization of the teeth.

6th.—That the varied and omnivorous diet of the human family and the disuse of their teeth have retarded the specialization of these organs.

7th.—That an invariable result of the effort of specialization is a reduction in the number of teeth.

8th.—That in the trituration of food there is a constant effort to establish such excursions or mandibular movements as will be most efficient to this pre-assimilative process.

9th.—That the mandibular movements in the effort of mastication must largely control the specialized condition of the teeth, the glenoid plates, and the condyles.

“DENTAL CARIES,” by A. Morsman, M.D., D.D.S. This is the third part of the article, and deals with lesions of the periosteum. I use the term “periosteum” because I believe it to be anatomically correct. Cement is modified bone, and its membrane is modified periosteum. The alveolus is true bone, and the layer of membrane overlying it is true periosteum. As a whole, the alveolo-dental membrane does not differ more from typical periosteum than periosteum differs in different parts of the osteological system. It is periosteum in structure and periosteum in function.

Periostitis.—This disease as a result of caries is always subsequent to the death of the pulp. We do not here have to do with that very common phase of periostitis which is post-operative and has its etiology in misapplied or over-zealous manipulation. We are concerned only with that form which is the result of the carious process

Periostitis as thus limited has but one cause, viz., the retention in the canal or pulp-cavity of putrescent matter. This statement is, perhaps, open to criticism as being too narrow in its limitations, but I believe it to cover the entire ground.

The clinical history and appearances, the diagnosis and treatment, are each considered.

“PROTRUDING TEETH, the limit of anchorage in bicuspid and molars,” by Dr. J. N. Farrar. This, the twenty-eighth article, deals with the treatment of protruding front teeth. Several illustrations serve to show the methods adopted.

"OBTURATORS," by P. J. Friedrichs, D.D.S. This was a paper read before the New Orleans State Dental Association in March last. The writer recounts the method which he adopted to cover over a perforation of the soft palate a quarter of an inch in front of the uvula.

THE INDEPENDENT PRACTITIONER. (*July, NEW YORK.*)

"THE USES OF FERRULES IN REGULATING TEETH: ROTATING, DRAWING AND RETAINING DEVICES," by J. N. Farrar, M.D., D.D.S. This article is an extract from an illustrated lecture, delivered before the Mass. State Dental Society, at Boston, December 11, 1885. A rotating apparatus consists of two requisites: the instrument of force and the means of attachment. These may be combined in one or in more pieces. While the former has been considered comparatively easy to devise, the means of firmly connecting it to the tooth has been regarded as quite the contrary. To overcome this difficulty I have devised several fixtures more or less complicated, some of which are simple and easy to operate, but most of them are practical only in the hands of experts. Since the advent of quick-setting cements, however, I have been able to increase the number of the simpler class through the aid of ferrules, which make the firm attachment of any instrument of force possible, under almost any circumstances. Several methods of application are shown.

To retain teeth after the enlargement of the dental arch, instead of the old-fashioned roof-plate, a skeleton device of half-round gold wire is preferred. Several modifications of this are shown.

"D.D.S. OR M.D.: WHICH?" by Geo. H. Chance, D.D.S. It will be admitted that dental surgery is a mechanical art applied, from a medico-scientific standpoint, to the dental organs and their associate parts, for the arrest and cure of disease, precisely as general surgery is a mechanical art applied from the same standpoint to other parts of the human body, and for a similar purpose, viz., for the arrest and cure of disease. Now, if the foregoing definition be accepted as correct, it logically follows that dental surgery is a legitimate branch of the healing art, and consequently a department of general medicine.

If you wish to become a dentist in something more than name, you must avoid the professional pirate, whether he sails a large ship or a small one, for we have both kinds. Secondly, place

yourself with a respectable, well-informed dental surgeon, who will direct you in your preliminary studies and properly prepare you for a dental college. Thirdly, don't bother yourself about the mystical title of M.D., for after you have honourably graduated as a dental surgeon you will know why it is that in this country, at least, the once honoured title of M.D. is largely a thing of the past. And when you are a dental surgeon, if you be a true man and would do unto others as you would they should do unto you, you will then seek, in general medicine, in the arts and sciences, or wherever else it may be found, what you will feel you must need—more light and more knowledge.

“TEETH WITH EXPOSED PULPS: DEVITALIZATION AND SUBSEQUENT TREATMENT,” by B. Merrill Hopkinson, D.D.S., M.D. Before speaking of the manner of opening the pulp cavity and canals I must mention that, for some time past, in the cases I have chosen for the following method of practice, I have had gratifying success, viz., with the use of hydrochlorate of cocaine, as well as with the Fl. Extr. of Cannabis Indica, in removing the pulps of teeth upon the first visit of the patient. In these cases I apply the dam, make an application, allowing it to remain from five to ten minutes, proceed as far as possible, make a second, perhaps a half-dozen, and in this way remove the pulp, by degrees; sometimes there may be slight pain, often the operation is painless. This method occupies more time than a man in full practice is usually able to devote to it, and until we find an agent which will anæsthetise the pulp more thoroughly and rapidly, most of us will continue the time-honoured and safe method of devitalization with arsenic. I regard a second application of arsenic as an impediment to ultimate success, and think the cases are very rare when it is necessary to use it a second time; still, if necessary, a smaller quantity should be used. Where there is considerable pain experienced in the removal of the *débris* after supposed devitalization, I think it a good plan to employ cocaine or cannabis indica, and in such cases they act much more rapidly. I also find in teeth of very dense structure that the application of zinc chloride, in full strength, to the canals acts most happily, and enables me to remove the remains easily and painlessly.

Third molar roots are very uncertain, and I rarely attempt to save these teeth if the pulp cannot be saved alive.

“ABOUT COCAINE,” by Dr. C. E. Francis. Although cocaine

has been employed within the past two years in thousands upon thousands of instances by oculists, dentists, surgeons and physicians in general practice in this and other countries, and has also been dispensed by druggists in all communities for various troubles of a painful character, very few cases have been reported where its use is supposed to have produced serious ill effects, and even in the few cases reported the diagnosis of each has been exceedingly vague and unsatisfactory. Cocaine has been dropped into the eye in innumerable instances for operations on that organ. It has found its way into the nares and in every part of the oral cavity. It has played an active part in the removal of tumours, and for dressing burns and wounds of every character has done great service. In cases of neuralgia it has been applied in form of a lotion, also injected hypodermically. It has been largely used as a tonic, and in countries where the coca leaves are produced the natives have for many years been in the habit of chewing them, or imbibing a decoction made therefrom. And yet what agent of like potency, so freely used, has been the cause of less mortality? Indeed, have any well authenticated cases of death by "coca poisoning" been reported?

In our specialty the use of cocaine is considerably limited, as it affects only soft tissue. Applied to sensitive dentine it is valueless, and to inject hypodermically with a view to render dental operations less painful is a practice of doubtful expediency. It, however, has its place as a local anæsthetic, and is valuable for certain purposes, and therefore should not be too hastily condemned, or unreasonably so. That it may prove an agent of mischief if used indiscriminately can hardly be denied, and due caution is requisite in the employment of not only this, but all drugs possessing such marked characteristics.

"IRREGULARITIES OF THE TEETH AND THEIR TREATMENT," by F. E. Howard, M.D.S. A paper read before a Union Meeting of the Seventh and Eighth District Dental Societies of the State of New York. It would be impossible to include all that might be said on this subject in one paper of this kind, or even in a volume. We can only touch upon certain prominent points in the treatment of general cases presented, and the ingenuity of the practitioner must be exercised in carrying out in detail the minor points that have to be observed.

Among the most frequent cases presented are those demanding

the bringing down of canines to their proper position, the irregularity being caused by lack of room.

A very important consideration in this work is to simplify the operation as much as possible. We should not keep young subjects in our hands for months, when by simplifying the operation as many weeks would suffice to accomplish results that are practically as good—where the difference in results would only be noticed by a dentist. Perhaps, in the majority of cases, we would be warranted in removing the bicuspid and pulling the canine down to place; at other times the extraction of the canine and the cutting off of the inner cusp of the bicuspid and converting it into a canine would be far better.

For the rotary movement of a tooth, a band of platinum with an arm attached and cemented to the tooth is a powerful agent for twisting such a tooth into position. Also a good and simple method for this movement, as supplied to the four anterior teeth, is accomplished by tying a waxed silk thread to any of them, taking two or three turns around the tooth and attaching to a rubber ligature fastened at some convenient point in the plate. The force exerted is in a direction to unwind the ligature from the tooth, and thus it is turned in its socket.

At the meeting of the Illinois State Dental Society, Dr. McKellops referred to the alleged practice of Dr. Younger, who bores holes in the jaw and inserts teeth in them. He also referred to a case in which Dr. Morrison had extracted a tooth from one locality in the jaw and inserted it in an artificial cavity in another place.

Dr. Barrett said that if any miracles were to be performed, he should look for their accomplishment in St. Louis, and the man there who could reverse the processes of nature, if anyone could, would be Dr. Morrison. He had heard of the case referred to by Dr. McKellops, and was assured by credible dentists that what most people would think but an apochryphal story was a veritable fact. He could not conceive of the possibility of the existence of bone without its periosteum, nor of tooth without its pericementum. Nor could he comprehend how pericementum would proliferate in a gimlet-hole. But Dr. McKellops had thrown a new light upon the Morrison case by admitting that the tooth was inserted in what was a previous tooth-socket.

OHIO STATE JOURNAL OF DENTAL SCIENCE. (*July, OHIO.*)

"HOW MAY WE RAISE THE STANDARD OF APPRECIATION OF DENTAL SERVICES?" by Dr. F. S. Whitslar. A paper read at meeting of Odontological Society of Western Pennsylvania and at the Northern Ohio Association. The subject involved in answering the above query is a broad one, and covers so much ground that time would fail us to discuss it in all its bearings. There is a negative as well as an affirmative side to the subject. In considering the negative side, we introduce to you two classes, the extremes on that side of our subject. The first-class of these extremes are known as the charlatans in the profession. The other extreme is that class of individuals who perch themselves so high that they fancy that they have no equals, that arrogate to themselves what they do not possess, and assume positions that they are incapable of filling, and wrench from the pocket of honest persons money which may be counted as ill-gotten, and which is usually ill-spent.

These two classes are the extremes of our profession, and while seemingly so widely separated, are actuated by the same spirit, differing only in this, that the narrow conception of the one prompts him to promise everything for nothing, while the impudence and avarice of the other demand for nothing everything. These, with the "go-betweens," constitute the mill-stone which hangs upon the neck of the profession, and tends to pull it down to the level of their own dishonesty, and as a result destroy a due appreciation of the value of dental services.

Elevate the standard of dental education to a plane where it will demand the recognition and respect of the other learned professions, and you have taken the first step in raising the standard of appreciation of dental services.

Legislative enactments, of a wise and stringent character, rigidly enforced, are a means to protect suffering humanity, and provide professional skill that will render services worthy of appreciation. Your attention has been called to the necessity of an elevated standard in dental education. I wish to emphasize the thought by saying that a thorough and correct medical education preceded and resting upon a good course of mental discipline and literary acquirement, must henceforward be regarded as the basis of our superstructure.

The Annual Meeting of the Northern Ohio Dental Association is reported.

The working of the "DENTAL COLLEGE INFIRMARIES" is the subject of a short article by Dr. A. Berry.

THE SOUTHERN DENTAL JOURNAL. (*July, ATLANTA.*)

"MEN AND BRETHREN, ARE THESE THINGS SO?" An essay on education, before the South Carolina Dental Association, June, 1886, by Alfred T. Peete. Dental colleges are numerous, and their number increases every year. Moreover, it is estimated that one-half the number of existing colleges could supply all the demand for such instruction as they afford. The truth is, we have in this State a host of men practising without permit or any other authority, and who know rather less about the science of dentistry than they do about astrology.

Now, who is responsible for this state of things? I am afraid the Dental Association will have to shoulder most of it. A law has been enacted, presumably sufficient to meet the case. If further legislation were needed, it could be obtained. The people have entrusted the execution of the law to the hands of our association, and look to us for protection. It rests with the gentlemen here present to say what shall be done, or whether things shall remain *in statu quo*.

"WHEREIN WE HAVE FAILED," by J. T. Calvert. After all our progress and extended learning, this one fact remains, plain and unvarnished: we have not taught the largest class of our patients things necessary for them to know concerning the care and preservation of their teeth. We have done them especial wrong in allowing them to remain in such dense ignorance in regard to their children's teeth. The fault lies wholly at our door, and can be remedied only by the tired, overworked practitioners who come in daily contact with those who are so sadly in need of knowledge. No professors, no theorists, no technical work, can remedy the evil. It must be done by each individual member of the profession, in the peculiar way best adapted to meet his own peculiar views.

Some one may claim that if the public desired such knowledge, they would seek it; but can anyone tell me just where the needed information is to be obtained? Can anyone name over a half dozen plain sensible books calculated to teach an ordinarily intelligent layman the fundamental A B C of dentistry? By

dentistry, I mean the common-sense practical knowledge of the teeth, and their relation to the body of man, and not the technicalities, which belong only to the profession. "The Mouth and the Teeth," by J. W. White, one of the series of American Health Primers, is a book well worthy of its high place. Mrs. M. W. J.'s "A Mother to Mothers" meets a long-felt want in a manner truly admirable. From such works as these the masses might learn much that is needful. The question is, how can we place such information in the hands of those who desire it? How can we teach the more ignorant and indifferent that such information would prove useful to them, and thus create the desire for it?

"NECESSARY QUALIFICATIONS OF THE DENTIST, AND HOW TO OBTAIN A DENTAL EDUCATION," by B. H. Teague, D.D.S. A paper read before the South Carolina Dental Association, June, 1886. In this country the colleges are in competition as to the number of students they annually matriculate and graduate. Their annual advertising circulars bring before the public in greater prominence the number of students to the institution than the high standard of their graduates. One is certain to graduate after two sessions, sometimes after one course of lectures, and then "dental mining" begins with him. The colleges thus foster the American idea of business—"short cuts to success." This hothouse graduation is also encouraged by the laxity of the dental laws in most States. With a diploma, it matters not where or how obtained, a "graduate" can practise. A noble exception is the law of a neighbouring State, which empowers the State Board of Examiners to judge of the qualifications of the applicant before a license is granted. To compel thoroughness in dental education, and as a protection to the public, dentists should be careful in their selection of students; our colleges should be endowed, and our dental laws exacting. So long as we have merely college-taught students, as the majority are now, and weak dental laws, so long will we have half-educated and incompetent dentists, to humiliate the profession of dentistry and impose on the public.

"BRIDGE-WORK." Dr. L. P. Haskell's opinion of it. While there are occasional cases where this method is advisable, they are the exceptions.

In a vast majority of cases where bridge-work is used, a narrow, nicely-fitting gold plate, secured by properly-adjusted clasps,

upon the same teeth which had been permanently enclosed for bridge-work, would answer the same purpose, and could be readily removed for cleansing, and no harm done to the natural teeth. I have been in the habit of making such plates for forty years, and can testify from this long experience.

When I speak of properly-adjusted clasps, I mean a narrow (platinum alloyed gold) clasp, nicely adjusted to the tooth, and arranged with wax upon the plate, in the mouth (never by a plaster cast). Then invest in the plaster and sand, and solder, attaching only at one point one-eighth of an inch, or but little more, so that the clasp will be springy and have free play. Then if this is kept clean, it will do no harm to the tooth.

The truth of the matter is, that bridge-work enables the dentist to secure large fees, regardless of the interests of patients—often twice or three times what would be charged for gold plates by the usual process.

The patient, of course, is pleased with the work, never suspecting what is in store in the near future—the loss of valuable teeth, and the final resort to a suction plate.

“SECRET PREPARATIONS IN PHARMACY, AND PATENTS,” by B. H. Catching, D.D.S. A paper read before the Georgia Dental Society, May, 1886. He who puts forth a secret preparation assumes to know it all, ranking his ability far beyond that of all others, and proposes that intelligence shall be chained while empiricism shall flourish. To the patrons of such preparations belongs the acknowledgment that all of our facilities for improvement are for naught, or that they are sadly deficient in the very fundamental principles of medical education. The throttling of this great evil will never be accomplished so long as those of us who are presumed to lead the profession patronize and endorse such productions. We owe it to ourselves, to the profession, and to our patrons, that secret preparations in pharmacy be denounced. We must hurl them back upon the vendors, and consider them as insults to our ability as physicians and our characters as men.

To speak and write this way does not tend to make any one popular; but would it not be better to be unpopular by claiming and demanding higher professional worth than to seek popularity at the expense of professional honour?

The Eighteenth Annual Meeting of the Georgia State Dental Society is reported.

Editorial.

PASSING EVENTS.

IF any evidence were wanting to indicate the progress of the dental profession, there could not be presented more forcible testimony than passing events. Without anticipating the annual meeting of the British Dental Association, to be held in the metropolis during this month, and which has every prospect of being quite as successful as any preceding meeting, reference can be made to three recent events as indicative of the results of "bread cast upon the waters," and its "return after many days."

In the pages of this number of the DENTAL RECORD are given the reports of three very successful meetings—the Distribution of Prizes and Conversazione in connection with the London School of Dental Surgery, and the first meeting of the Southern Counties' Branch, and the Annual Meeting of the Western Counties' Branch of the British Dental Association.

At the former gathering Mr. J. Smith Turner, who has done so much for dental reform, spoke of an unquestionable fact when he said that "those outside the profession will see that we are not allowing the profession to develop in a haphazard manner." No; thirty years ago a definite scheme of education was formulated, and, as Mr. Rymer observed, "it has gradually become clearly understood that the L.D.S. degree must always stand as *the* qualification of the dentist." This steady development of the profession, also referred to by Mr. Rymer in his Presidential Address, is set forth in "the aims of the British Dental Association, which aims may be summarised as meaning a steady and progressive action towards the attainment of sound professional status under the provisions of the 'Dentists' Act.' The aims are further directed towards bringing men periodically together in social companionship and scientific conference, thus producing a personal sympathy otherwise unattainable."

Whilst these events show how favourably the profession has improved, we must not rest upon our oars. Much has yet to be done in further extending knowledge, education and examination, and especially that intra-professional culture to which Mr. Turner so opportunely referred.

PASS LIST.

ROYAL COLLEGE OF SURGEONS, EDINBURGH.

DURING the July sitting of the Examiners, the following gentlemen passed their Final Examination and were admitted Licentiates in Dental Surgery:—Harry Graham Smith, Edinburgh; Frank Gordon Allen, Derbyshire; and James Taylor, Lancashire.

GOSSIP.

MONTHLY STATEMENT of operations performed at the two Dental Hospitals in London, and at two Provincial Hospitals, from June 1st to June 30th, 1886:—

	London.	National.	Birmingham.	Manchester
Number of Patients attended...	2,818	1,655	996	739
Extractions {	Children under 14	428	408	756
	Adults	960	641	
	Under Nitrous Oxide	690	486	
Gold Stoppings	314	77	—	19
Other Stoppings	937	538	70	62
Advice and Scaling	179	256	—	—
Irregularities of the Teeth ...	176	225	3	—
Miscellaneous	400	157	167	215
Total	<u>4,084</u>	<u>2,788</u>	<u>1,025</u>	<u>871</u>

MR. CHAS. F. FORSHAW sends the notes of a case of a supernumerary lateral, and a kind of quadricuspid central incisor on the right side of the upper jaw of a boy æt. twelve. The lateral was extracted and had a bifurcated root. The four cusps, representing the crown of the central, were all fused together, and the tooth occupied the normal position.

THE following applications for patents have been made:—8572.—June 30, 1886.—A. P. Patterson. Improvements in and relating to dentures. 8621.—July 1, 1886.—J. Law. Cleaning pulp cavities of teeth—an instrument for use in operative dentistry, named a “Pulp cleaner.”

MR. W. S. SAVORY has been re-elected president of the Royal College of Surgeons.

COLOURED LACQUER.—To make zinc appear like copper various tinted lacquers are, says the *Scientific American*, thus made:— (1) 4 oz. best gum gamboge dissolved in 32 oz. spirits of turpentine; (2) 4 oz. dragon's blood in the same quantity of spirits of turpentine, and (3) 1 oz. annatto in 8 oz. of the spirit. The three mixtures should be made in different vessels. They should then be kept for about two weeks in a warm place, and as much exposed to the sun as possible. At the end of that time they will be fit for use, and any desired tints may be obtained by making a mixture from them, with such proportions of each liquor as the nature of the colour desired will point out.

THE presence of a third eye at the top of the head of certain lizards was described by Professor Bell at a recent meeting of the Royal Microscopical Society.

IN discussing the subject of "The Determination and Causation of Sex," at a meeting of the Montreal Medico-Chirurgical Society, Dr. Cameron related the essential points of Starkweather's theory.

1. The male and female elements share equally in the determination of sex.
2. Sex is determined by the superior the potentiality of one or the other.
3. The superior parent or element (at the time of fruitful intercourse) determines the opposite sex in the offspring—cross-heritage, as it has been called.
4. In the great majority of cases, it is possible to prognosticate the sex that will result from the union of certain parents.
5. The sex of offspring is, or might be, generally within the control of parents.
6. This law holds good for the lower animals as well as man.

This theory is ingenious and contains much truth, but is as yet far from proven.

THE fund collected for the benefit of the widow and children of Mr. Alfred Tribe, F.C.S., F.I.C., deceased, amounts to £766 19s. After deducting £35 for expenses, the balance was vested in three trustees, to be administered according to a trust deed.

AN incisor tooth which was removed from the orbit of a child two years of age was exhibited by Dr. Ward Cousins at the annual meeting of the Southern Branch of the British Medical Association. It was very perfect in outline and structure, and was regarded not as a product of a dentigerous cyst, but as a specimen of a displaced tooth during an early stage of development.

IN his Presidential address at the Fifth Annual Meeting, on the 14th ult., of the Society of Chemical Industry, Mr. E. K. Muspratt said he looked forward to the not distant day when by means of improved secondary education, and the work of institutions like Owen's College, and University College, Liverpool, our manufacturers will be able to find men ready to carry on, with even greater success than in the past, a large portion of the great chemical industry of the world.

AT the Annual Meeting of the National Veterinary Association, held in Edinburgh, on the 22nd ult., the President moved that "The time has now come when it is advantageous that a higher degree—viz., that of Doctor Veterinary Medicine—than that of Fellow should be substituted by the Royal College of Veterinary Surgeons, this being necessary to place the profession on the same footing as that enjoyed by other professions and the sciences." It was agreed to postpone the consideration of the motion till next meeting, in order to have it fully discussed.

THE next (September) issue of the DENTAL RECORD will, as usual, form the Students' Number.

OWING to the Metropolitan Board of Works renaming the street, the office of this journal is now 6, Lexington Street, Golden Square, London, W.

THE DENTAL RECORD.

VOL. VI.

SEPTEMBER 1, 1886.

No. 9.

Educational Section.

SUGGESTIONS TO STUDENTS.

THE Professional Education of the Dental Student consists of:—

1. Apprenticeship, or instruction in Mechanical Dentistry, for a period of not less than three years.
2. Attendance on Lectures, &c., at a General Hospital and Medical School for two Winter and one Summer Sessions—eighteen months.
3. Also attendance at a Dental Hospital and School for two years.

The attendance at the General Medical and at the Special Dental Hospitals and Schools may be carried out simultaneously, and completed in two years. This plan of work takes up the whole of the Student's time, and it is impossible for him to concurrently engage in any Mechanical or other employment.

Before commencing his Professional Education (or apprenticeship), the Dental Student must pass a Preliminary Examination in Arts. The examination most to be recommended is the matriculation of the University of London. Passing that examination will enable the student subsequently to present himself for an University degree, should he desire to do so. A list of the several examinations recognised by the General Medical Council as fulfilling the conditions required by that body regarding Preliminary Education is to be found on page 388.

Any one who commenced his professional education before

the 22nd July, 1878, is exempt from the Preliminary Examination.

After passing a Preliminary Examination, the student must receive at least three years' instruction in Mechanical Dentistry under a registered Dentist. It should be distinctly understood that the Royal College of Surgeons of England consider those three years of instruction, whether in the form of serving articles, or apprenticeship to Mechanical Dentistry, or otherwise, as Professional Education; therefore, they follow the Preliminary Examination.

Having received a certificate of his Preliminary Examination, and commenced his Professional Education, either by apprenticeship or by hospital studies, it is necessary to register the same at the Medical Council Office, 299, Oxford Street, London, W. This must be done within fifteen days from the commencement of the pupil's professional studies. The beginning of such studies will not be recognised by any of the Qualifying Bodies as dating earlier than fifteen days before the time of registration.

Any one registered as a Medical Student must also register as a Dental Student, if he be such.

Having served his articles, the student may enter a General or a Dental Hospital, or both, and complete the curriculum of at least four years of study from the date of registration; after which he is eligible to be admitted to examination for the Dental License.

Though the possession of the License in Dental Surgery is necessary for a name to be entered on the *Dentists' Register*, the student is strongly recommended to obtain some additional qualification in either Medicine or Surgery. On the other hand, though a Medical or a Surgical, other than the special Dental qualification, entitles its possessor to practise Dentistry, yet the course of study for such does not include any Dental instruction. Therefore, to be a Dentist requires a more or less complete compliance with the Dental Curriculum.

It will be observed that the Curricula of the several Licensing Bodies differ somewhat from one another. The

Curriculum of the Royal College of Surgeons of England exceeds the minimum course of study recommended by the Medical Council by prescribing attendance upon a second course of lectures on Dental Anatomy, Dental Surgery and Dental Mechanics ; so also does the Curriculum of the Royal College of Surgeons in Ireland, by requiring a course of Practical Physiology and an extra six months' General Hospital Practice, besides three examinations at different periods. The Royal College of Surgeons of Edinburgh, and the Faculty of Physicians and Surgeons of Glasgow, require only six, instead of not less than twelve months' attendance, at a recognised General Hospital, with clinical instruction.

REGISTRATION OF DENTAL STUDENTS.

The Registration of Dental Students shall be carried on at the Medical Council Office, 299, Oxford Street, London, W., in the same manner as the existing Registration of Medical Students—as hereinafter set forth—and subject to the same regulations as regards Preliminary Examinations.

Students who commenced their professional education by apprenticeship to Dentists entitled to be registered, or by attendance upon professional lectures, before July 22nd, 1878 (when Dental education became compulsory), shall not be required to produce evidence of having passed a Preliminary Examination.

Pupils who have been articled to their fathers or to brothers—with whom money transactions would be nominal—shall, in all other respects, be considered to be in the same position in regard to registration as those pupils provided for in the first part of Section 57 of the Dentists' Act, who have paid premiums for instruction.

Candidates for a Diploma in Dental Surgery shall produce certificates of having been engaged during four years in Professional Studies, and of having received three years' instruction in Mechanical Dentistry from a registered Practitioner.

One year's *bonâ fide* apprenticeship with a registered Dental

Practitioner, after being registered as a Dental Student, may be counted as one of the four years of Professional Study.

The three years of instruction in Mechanical Dentistry, or any part of them, may be taken by the Dental Student either before or after his registration as a Student ; but no year of such mechanical instruction shall be counted as one of the four years of Professional Study unless taken after registration.

The privilege provided by the first clause of Section 37 of the Dentists' Act, for persons whose Articles of Apprenticeship expired before January 1st, 1880, shall be extended to all persons whose Articles had begun two years before that period.

The commencement of the course of Professional Study recognised by any of the Qualifying Bodies shall not be reckoned as dating earlier than fifteen days before the date of registration.

Forms for Registration may be obtained at the office of the General Medical Council. No fee is required for registration as a Student.

PRELIMINARY EDUCATION.

REGULATIONS OF GENERAL MEDICAL COUNCIL.

No person shall be allowed to be registered as a Medical or a Dental Student unless he shall have previously passed (at one or more Examinations) a Preliminary Examination in the subjects of General Education as specified in the following List :—

1. English Language, including Grammar and Composition ;
2. Latin, including Grammar, Translation from specified authors, and Translation of essay passages not taken from such authors ;
3. Elements of Mathematics, comprising (α) Arithmetic, including Vulgar and Decimal Fractions, (β) Algebra, including Simple Equations, (γ) Geometry, including the first book of Euclid, with easy questions on the subject-matter of the same ;
4. Elementary Mechanics of Solids and Fluids, comprising the Elements of Statics, Dynamics, and Hydrostatics ;
5. One of the following optional subjects :—
(α) Greek ; (β) French ; (γ) German ; (δ) Italian ; (ε) any

other Modern Language; (ζ) Logic; (η) Botany; (θ) Zoology; (ι) Elementary Chemistry.

List of Examining Bodies whose Examinations fulfil the conditions of the Medical Council as regards Preliminary Education, and entitle to Registration as Medical or Dental Student.*

I.—UNIVERSITIES IN THE UNITED KINGDOM.

UNIVERSITY OF OXFORD:—

1. Junior Local Examinations; Certificate to include Latin and Mathematics, and also one of the following optional subjects:—
Greek, French, German.
2. Senior Local Examinations; Certificate to include Latin and Mathematics.
3. Responsions.
4. Moderations.
5. Examination for a Degree in Arts.

UNIVERSITY OF CAMBRIDGE:—

6. Junior Local Examinations; Certificate to include Latin and Mathematics, and also one of the following optional subjects:—
Greek, French, German.
7. Senior Local Examinations; Certificate to include Latin and Mathematics.
8. Higher Local Examinations.
9. Previous Examinations.
10. Examination for a Degree in Arts.

UNIVERSITY OF DURHAM:—

11. Examination for Certificate of Proficiency.
12. Examination for Students at the end of their first year.
13. Examination for a Degree in Arts.

UNIVERSITY OF LONDON:

14. Matriculation Examination.
15. Preliminary Scientific (M.B.) Examination.
16. Examination for a Degree in Arts or Science.

* Provided that, in all cases, the subject of Mechanics, as set forth in clause 4 on p. 388, be shown to have been included in the Examination.

VICTORIA UNIVERSITY :—

17. Preliminary Examination ; Latin to be one of the subjects.
18. Entrance Examination in Arts, to include all the subjects required.

UNIVERSITY OF EDINBURGH :—

19. Local Examination (Junior Certificate) ; Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects :—
Greek, French, German.
20. Local Examinations (Senior Certificate) ; Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects :—
Greek, French, German.
21. Preliminary Examination for Graduation in Science or Medicine and Surgery.
22. Examination for a Degree in Arts.

UNIVERSITY OF ABERDEEN :—

23. Local Examination (Junior Certificate) ; Certificate to include all the subjects required.
24. Local Examinations (Senior Certificate) ; Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects :—
Greek, French, German.
25. Preliminary Examination for Graduation in Medicine or Surgery.
26. Examination for a Degree in Arts.

UNIVERSITY OF GLASGOW :—

27. Local Examinations (Junior Certificate) ; Certificate to include all the subjects required.
28. Local Examinations (Senior Certificate) ; Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects :—
Greek, French, German.
29. Preliminary Examination for Graduation in Medicine or Surgery.
30. Examination for a Degree in Arts.

UNIVERSITY OF ST. ANDREWS:—

31. Local Examinations (Senior Certificate); Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects:—
Greek, French, German.
32. Local Examination (Junior Certificate); to include all the subjects required.
33. Preliminary Examination for Graduation in Medicine or Surgery.
34. Examination for a Degree in Arts.

UNIVERSITY OF DUBLIN:—

35. Public Entrance Examination.
36. General Examination at end of Senior Freshman year.
37. Examination for a Degree in Arts.

QUEEN'S UNIVERSITY IN IRELAND:—

38. Local Examinations for men and women; Certificate to include all the subjects required by the General Medical Council.
39. Entrance or Matriculation Examination.
40. Previous Examination for B.A. Degree.
41. Examination for a Degree in Arts.

ROYAL UNIVERSITY OF IRELAND:—

42. Matriculation Examination.

OXFORD AND CAMBRIDGE SCHOOLS' EXAMINATION BOARD:—

43. Certificate to include the following subjects:—An adequate knowledge of English Grammar and Orthography, as shown in the course of the Examination, to the satisfaction of the Examiners, being held as conforming to the requirements of the Medical Council in regard to those subjects:—
 - (a) Arithmetic, including Vulgar and Decimal Fractions;
 - (b) Algebra, including Simple Equations;
 - (c) Geometry, including the first two books of Euclid;
 - (d) Latin, including Translation and Grammar;
 - (e) Also one of these optional subjects:—
Greek, French, German.

II.—OTHER BODIES NAMED IN SHEDULE (A) TO THE MEDICAL ACT.

APOTHECARIES' SOCIETY OF LONDON:—

44. Examination in Arts.

ROYAL COLLEGES OF PHYSICIANS AND SURGEONS OF EDINBURGH:—

45. Preliminary (combined) Examination in General Education.

FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW:—

46. Preliminary Examination in General Education.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—

47. Preliminary Examination; Certificate to include Mathematics.

III.—EXAMINING BODIES IN THE UNITED KINGDOM, NOT INCLUDED IN SHEDULE (A) TO THE MEDICAL ACT (1858).

COLLEGE OF PRECEPTORS:—

48. Examination for a First Class Certificate, or Second Class Certificate of First or Second Division, Algebra, Geometry Latin, and a Modern Language, having been taken.

QUEEN'S COLLEGE, BELFAST:—

49. Matriculation Examination.

QUEEN'S COLLEGE, CORK:—

50. Matriculation Examination.

QUEEN'S COLLEGE, GALWAY:—

51. Matriculation Examination.

INTERMEDIATE EDUCATION BOARD OF IRELAND:—

- | | |
|------------------------------|--|
| 52. Junior Grade Examination | } Certificate in each case to include all the subjects required. |
| 53. Middle Grade Examination | |
| 54. Senior Grade Examination | |

ST. DAVID'S COLLEGE, LAMPETER:—

55. Responsions Examination, to include all the subjects required.

EDUCATIONAL INSTITUTE OF SCOTLAND:—

56. Preliminary Medical Examination.

IV.—CERTAIN INDIAN, COLONIAL AND FOREIGN UNIVERSITIES AND COLLEGES.

REGULATIONS OF THE VARIOUS EXAMINING BODIES FOR THE DIPLOMA IN DENTAL SURGERY.

PROFESSIONAL EDUCATION REQUIRED BY THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Candidates are required to produce the following Certificates :—

1. Of being twenty-one years of age.
2. Of having been engaged during four years in the acquirement of professional knowledge.
3. Of having attended, at a school or schools recognised by this College, not less than one of each of the following courses of lectures, delivered by lecturers recognised by this College, namely: Anatomy, Physiology, Surgery, Medicine, Chemistry and Materia Medica.
4. Of having attended a second winter course of lectures on Anatomy, or a course of not less than twenty lectures on the Anatomy of the Head and Neck, delivered by lecturers recognised by this College.
5. Of having performed dissections at a recognised school during not less than nine months.
6. Of having completed a course of chemical manipulation, under the superintendence of a teacher or lecturer recognised by this College.
7. Of having attended, at a recognised hospital or hospitals in the United Kingdom, the practice of Surgery and Clinical Lectures on Surgery during two Winter Sessions.
8. Of having attended, at a recognised school, two courses of lectures upon each of the following subjects, namely:—Dental Anatomy and Physiology (Human and Comparative), Dental Surgery, Dental Mechanics, and one course of lectures on Metallurgy, by lecturers recognised by this College.
9. Of having been engaged during a period of not less than three years in acquiring a practical familiarity with the details of Mechanical Dentistry, under the instruction of a competent Practitioner. In the cases of qualified Surgeons, evidence of a period of not less than two, instead of three years, of such instruction will be sufficient.

10. Of having attended at a recognised Dental Hospital, or in the Dental Department of a recognised General Hospital, the practice of Dental Surgery during the period of two years.

NOTE.—All candidates who shall commence their professional education on or after the 22nd July, 1878, will, in addition to the certificates enumerated in the foregoing clauses, be required to produce a certificate of having, prior to such commencement, passed the preliminary examination in general knowledge for the Diploma of Member of the College, or an examination recognised as equivalent to that examination.

Candidates who were in practice as Dentists, or who had commenced their education as Dentists prior to September, 1859—the date of the Charter—and who are unable to produce the certificates required by the foregoing Regulations, shall furnish the Board of Examiners with a Certificate of Moral and Professional Character, signed by two Members of this College.*

Together with answers to the following inquiries:—

Name	Age	Professional Address.
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If in practice as a Dentist, the date of the commencement thereof.
Whether Member or Licentiate of any College of Physicians or Surgeons of the United Kingdom; and if so, of what College.
Whether Graduate of any University in the United Kingdom; and if so, of what University; and whether Graduate in Arts or Medicine.

The date or dates of any such Diploma, License or Degree.

Whether Member of any Learned or Scientific Society; and if so, of what.

Whether his practice as a Dentist is carried on in connection with any other business; and if so, with what business.

Whether, since 22nd July, 1876, he has employed Advertisements or Public Notices of any kind in connection with the practice of his Profession.

The particulars of Professional Education, Medical or Special.

* N.B.—In the case of candidates in practice, or educated in Scotland or Ireland, the Certificate of Moral and Professional Character may be signed by two Licentiates of the Royal College of Surgeons of Edinburgh, or the Faculty of Physicians and Surgeons of Glasgow, or of the Royal College of Surgeons in Ireland, as the case may be.

The Board of Examiners will determine whether the evidence of character and education produced by a Candidate be such as to entitle him to examination.

PROFESSIONAL EXAMINATION.

The Examination is Written, Oral and Practical.

The Written Examination comprises General Anatomy and Physiology, and General Pathology and Surgery, with especial reference to the practice of the Dental Profession.

The Oral and Practical Examinations comprise the several subjects included in the curriculum of professional education, and is conducted by the use of preparations, casts, drawings, and by operations, &c.

Members of the College, in the Written Examination, will only have to answer those questions set by the Section of the Board consisting of persons skilled in Dental Surgery; and in the Oral and Practical Examinations will be examined only by that Section.

A candidate whose qualifications shall be found insufficient will be referred back to his studies, and will not be admitted to re-examination within the period of six months, unless the Board shall otherwise determine.

Examinations will be held in January, June and October.

The Fee for the Diploma is Ten Guineas, over and above any stamp duty.

NOTE.—A ticket of admission to the Museum, to the Library, and to the College Lectures, will be presented to each candidate on his obtaining the Diploma.

SYLLABUS OF EXAMINATION.

In addition to the Special Examination by the Dental Section of the Board of Examiners, candidates are expected to answer questions in the written and *vivâ voce* Examinations on the following subjects:—

ANATOMY AND PHYSIOLOGY.

The names of the Bones, and of their more important parts and their articulations.

The names and position of the principal Arteries, Veins, and Nerves.

The form and relations of the Viscera of the Head, Chest, and Abdomen, and an elementary knowledge of their structure.

An elementary knowledge of the structure and properties of the principal tissues.

An elementary knowledge of the functions of Digestion, Absorption, Circulation, Respiration, Secretion, Motion, and Sensation.

The Surgical Anatomy and Physiology of the Organs of Mastication, Deglutition, Taste, and Articulation.

PATHOLOGY AND SURGERY.

Inflammation and its consequences.

The healing of Wounds.

The methods of arresting Hæmorrhage.

The union of Fractures.

The signs of Asphyxia, and the treatment of threatened death from Anæsthetics.

The injuries and diseases of the Jaws, Mouth, Fauces, and adjacent parts.

EDWARD TRIMMER, *Secretary*.

PROFESSIONAL EDUCATION REQUIRED BY THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

PRELIMINARY EXAMINATION.

Candidates for the Dental Diploma must produce evidence of having attained the age of twenty-one years, and will require to produce a Certificate of having passed the Preliminary Examination in General Education required for the ordinary License in Surgery, or an examination equivalent to this, and recognised by the General Medical Council,—except in the case of candidates who shall have commenced their professional education previous to the first day of August, 1878.

PROFESSIONAL EXAMINATION.

Candidates will also be required to produce Certificates of having been engaged during four years in the acquirement of professional knowledge, and of having been during that period, or at some time previous to their examination, engaged for not less than three years in the acquirement of a practical knowledge of Mechanical Dentistry with a practitioner registered under this Act.

LECTURES AND HOSPITAL ATTENDANCE.

The following Lectures and other Courses of Instruction must have been attended by candidates for the Dental Diploma, at a recognised Medical School or Schools; and the number of Lectures in each of the general courses must correspond with those required for the Surgical Diploma of the College:—

Anatomy.—One Winter course.

Dissections and Demonstrations.—Nine months.

or

Dissections ... } Nine months.

and

Anatomy of Head and Neck } One course of Twenty Lectures.

Physiology ... } One course of not less than
Fifty Lectures.

Chemistry ... One Winter course.

Surgery ... One Winter course.

Medicine ... One Winter course.

Materia Medica ... One course of Three Months.

Practical Chemistry and }
Metallurgy ... } One course of Three Months.

Clinical Instruction in Sur- } One course of Six Months,
gery at a recognised Hos- } or
pital ... } Two courses of Three Months.

In addition to these, candidates will require to have attended the following Special Courses of Lectures and Instructions, in terms of the curriculum, and by teachers recognised by this College:—

Dental Anatomy and Physiology }
Dental Surgery and Pathology } One course of each.
Dental Mechanics ... }

Two years' attendance at a Dental Hospital or the Dental Department of a General Hospital recognised by the College.

Candidates who are Licentiates of this College, or who may be registered Medical Practitioners, will require to produce Certificates of Attendance on the special subjects only, and will be examined in these only for the Dental Diploma.

EXAMINATIONS.

The Dental Examinations shall be both Written and Oral, and be conducted in the same manner as the ordinary Surgical Examinations. These Examinations shall consist of two separate sittings, and be held subsequent to each period of the Ordinary Examinations, on such days as the College may appoint. Candidates must apply to the Secretary of the College on or before the Saturday preceding the Ordinary Examinations, and must then produce all the required Certificates of having passed the Preliminary Examination, and of having attended the Lectures and other prescribed courses of instruction.

SUBJECTS OF EXAMINATION.

The ordinary subjects of Examination will be Anatomy, Physiology, Chemistry (including Metallurgy), Surgery, Medicine and Materia Medica ; and the special subjects will be Dental Anatomy and Physiology, Dental Surgery and Pathology, and Dental Mechanics. Anatomy, Chemistry (with Metallurgy), and Physiology, will form the subjects of the first Examination ; Surgery, Medicine, Materia Medica, and the special subjects, those of the second.

TITLE AND DIPLOMA.

Those candidates who pass this Examination shall be entitled to the designation of Licentiate in Dental Surgery of the Royal College of Surgeons of Edinburgh, and shall obtain the Dental Diploma of the Royal College. Each candidate, before receiving his Diploma, shall, in entering his name in the books of the College, sign the following declaration :—

I hereby promise faithfully to maintain and defend all the rights and privileges of the Royal College of Surgeons of Edinburgh, and to promote its interests to the utmost of my power. I promise, in the event of my admission as a Dental Licentiate of that College, to refrain from advertising or employing any other unbecoming modes of attracting business, and I shall not allow my name to appear in connection with any one who does so. I also promise to obey all the laws of the said Royal College, made or to be made.

FEES, ETC.

The fee for the Dental Diploma shall be ten guineas. Each candidate, for the first examination, shall pay to the Secretary of the College the sum of four guineas not later than nine a.m. of the Saturday preceding the ordinary examinations; and in the event of a candidate being unsuccessful, two guineas will be returned to him. Where the candidate is successful, the sum of four guineas will be considered as paid to account of the diploma. Each candidate for the second examination shall pay to the Secretary of the College the sum of six guineas, not later than nine a.m. of the Tuesday preceding the second examination; and in the event of his being unsuccessful, three guineas will be returned to him. No candidate will, if unsuccessful, be remitted for a shorter period than three months. These rules will apply to any subsequent rejection.

EXAMINATIONS SINE CURRICULO.

Candidates who were in practice before the first day of August, 1878, or those not in practice but who had commenced their apprenticeship as Dentists before the first day of August, 1875, and who are unable to furnish the Board of Examiners with the certificates of lectures and hospital attendance required by the foregoing regulations, shall fill in the schedule of application as follows:—

1. Full name, age and address of candidate.
2. Certificates of moral and professional character, signed by two registered Medical Practitioners.
3. The date of commencing practice or Apprenticeship as a Dentist, and whether, if in practice, such practice has been carried on in conjunction with any other business, and, if so, with what business.
4. Whether he has any Degree or Diploma in Medicine or Surgery, and if so, from what College or University, or other body, and at what time it was obtained.
5. The particulars of professional education.

The President's Council shall, on such information being afforded them, determine whether or not the candidate may be admitted to examination for the Dental Diploma, and such examination shall, with the exception of the preliminary examination, and the exemptions in favour of Registered Medical Practitioners, as before

explained, be passed on the same subjects and in the same manner as is required for other candidates, and will confer the same privileges.

The following will be the periods of examination for the year 1886-87 :—

I. PRELIMINARY EXAMINATIONS IN GENERAL EDUCATION.

These examinations will be held in October, 1886, April, July and October, 1887

II. FIRST PROFESSIONAL EXAMINATIONS.

On Tuesday, October 5th, 1886.

On Tuesday, January 4th, 1887.

On Tuesday, April 19th, 1887.

On Tuesday, July 19th, 1887.

III. SECOND PROFESSIONAL EXAMINATIONS.

These will take place after the conclusion of the first professional examinations, at each of the above-mentioned periods. They will generally be begun on the Thursday succeeding the day of the first examination, and in no case on an earlier day.

SYLLABUS OF EXAMINATIONS.

In addition to a particular acquaintance with Dental Anatomy, Physiology and Surgery, candidates are expected to possess a general knowledge of at least the following subjects of examination :—

ANATOMY AND PHYSIOLOGY.

1. The Skeleton is general: the anatomical characters and articulations of the Bones; with the Muscles of the Inferior Maxilla and Upper and Lower Extremities.
2. Names and positions of the principal Blood-vessels and Nerves, and of the Viscera of the Chest and Abdomen.
3. General Anatomy of the Brain and Intercranial Nerves.
4. General knowledge of the functions of Circulation, Respiration and Sensation.
5. An Elementary knowledge of Histological Structures.

CHEMISTRY.

1. The Laws of Combination.
2. Sources or preparation and chemical properties of Oxygen, Hydrogen, Nitrogen, Carbon, Sulphur, and Chlorine.

3. A general acquaintance with the Chemistry of Potass, Soda, Ammonia, Iron, Lead, Gold, Copper, Zinc, Arsenic and Mercury.

MEDICINE, SURGERY, AND MATERIA MEDICA.

1. The nature and treatment of Inflammation, Hæmorrhage, Asphyxia, Syncope, Wounds and Fractures; along with an Elementary knowledge of Disease in general.
2. A general knowledge of the action of Narcotics, Emetics, Purgatives, Depressants, and Stimulants, with examples of the commoner substances used as each, and the modes of their prescription.

JOSEPH BELL, *Secretary*.

PROFESSIONAL EDUCATION REQUIRED BY THE
FACULTY OF PHYSICIANS AND SURGEONS OF
GLASGOW.

The regulations of the Faculty of Glasgow do not materially differ from those of the Royal College of Surgeons of Edinburgh.

The Dental Examinations will be held on October 12th, 1886, January 18th, 1887, April 26th, and July 12th.

The *Second Examination* will take place on the two days following the First Examination.

ALEXANDER DUNCAN, B.A., *Secretary*.

PROFESSIONAL EDUCATION REQUIRED BY THE
ROYAL COLLEGE OF SURGEONS IN IRELAND.

Every candidate for the License in Dentistry of the College shall produce evidence of having been registered by the General Medical Council as a student in medicine. Certificates of study will not be recognised by the College if the date of commencement of the course to which the certificate refers is more than fifteen days prior to such registration.

Every candidate for the License in Dentistry shall be required to pass a Preliminary Examination and three Professional Examinations.

PRELIMINARY EXAMINATION.

The regulations of the College which refer to the Preliminary Examination of the candidate for the Letters Testimonial (which see) shall apply to the candidate for the Dental License.

Candidates are strongly advised to pass in Physics at the Preliminary or Equivalent Examination.

PROFESSIONAL EXAMINATIONS.

The First and Second Professional Examinations shall be held in July and October of each year.

Should the Student fail to pass in July, he may present himself in October.

The Examination of each year must be passed before a new session can be entered on, but, in special cases, it shall be in the discretion of the Council of the College to permit the student, for what appears to them sufficient cause, to commence a new year of study, and subsequently present himself for a supplemental Examination.

FIRST PROFESSIONAL EXAMINATION.

The candidate is required, before admission to the First Professional Examination, to produce evidence of having been registered as a medical student by the General Medical Council; also to produce certificates of having subsequently attended—

Surgical department of a General Hospital, nine months.

Winter courses	{	Practical Anatomy, with Demonstrations and Dissections.
		Physiology.
		Surgery.
		Chemistry.
Summer courses	{	Practical Chemistry.
		Practical Physiology.
		Materia Medica.

The fee for this examination shall be £5 5s. Candidates who are rejected will be admitted to re-examination on paying an additional fee of £2 2s.

The subjects and order of this examination are identical with those of the Second Professional Examination for the Letters Testimonial of the College.

SECOND PROFESSIONAL EXAMINATION.

The candidate is required, before admission to the Second Professional Examination, to produce evidence of having passed the

First Professional Examination, also certificates of having subsequently attended—

Surgical department of a General Hospital, nine months.

Winter courses	{	Demonstrations and Dissections.
		Practical Anatomy.
		Surgery.
		Medicine.

The fee for this examination shall be £5 5s., and for re-examination, if rejected, £2 2s.

The subjects and order of this examination shall be identical with those of the Third Professional Examination for the Letters Testimonial of the College.

THIRD AND FINAL PROFESSIONAL EXAMINATION.

The Third Professional Examination shall be held in April, July, and October. The candidate is required, before admission to the Final Examination, to produce evidence—

- a. Of having passed the Second Professional Examination ; or of having obtained a diploma in Surgery recognised by the College.
- b. Of having attended, subsequent to registration by the General Medical Council, the following courses of Lectures recognised by the College :—

Dental Surgery and Pathology	} Of each two courses.
Dental Mechanics	
Dental Anatomy and Physiology	} One course.
Dental Metallurgy	
- c. Of having attended for two years the practice of a Dental Hospital recognised by the College.
- d. Of having been engaged in acquiring a practical knowledge of Mechanical Dentistry, for at least two years, in a public Laboratory recognised by the College ; or for at least three years under the instruction of a Registered Dentist. The candidate shall also submit a piece of mechanical work certified to be of his own making.

The candidate holding a diploma in Surgery recognised by the College shall be required to produce certificates of one course of each of the above special Dental subjects, and of half the Hospital

attendance and half the Laboratory work required from other Dental students.

As this remission has been made on the understanding that the Qualified Surgeon shall devote his whole time to the Dental work, the special Dental courses, Hospital attendances, and Laboratory work required from him, must all be taken out after the date of his diploma in Surgery.

FEES.

The fee for the Final Examination shall be, in the case of Licentiates in Surgery of the College, and for Dental students, £7 7s. For re-examination, if rejected, £4 4s.

For candidates holding a Surgical diploma other than that of the Royal College of Surgeons in Ireland, £12 12s. For re-examination, if rejected, £6 6s.

SUBJECTS OF EXAMINATION.

Candidates shall be examined in—

1. Dental Surgery—Theoretical, Clinical, and Operative.
2. Dental Mechanics—Theoretical and Operative.
3. Dental Anatomy and Physiology.
4. Metallurgy and Physics.

ORDER OF EXAMINATION.

FIRST DAY (PRINTED QUESTIONS).

Two hours shall be allotted to this examination. Three questions each in Dental Surgery, Dental Mechanics, Dental Anatomy, Metallurgy, and Physics shall be given. One question at least must be answered on each subject.

Candidates who have already passed in Physics at the Preliminary or Equivalent Examination shall be exempt from this subject at the Final Examination.

SECOND DAY (ORAL).

Each candidate shall be separately examined on each of the subjects of the first day.

THIRD AND FOURTH DAYS.

(Operative Dental Surgery and Mechanical Dentistry).

On these days the candidate's knowledge of Clinical Dental Surgery and Practical Operative Dentistry, and of Clinical Dental

Mechanics and Practical Mechanical work, shall be tested. Candidates shall be examined at Hospital, and in the Dental Laboratory, and shall be required to perform operations on the model, and to carry out such mechanical work as the examiner shall direct.

REJECTED CANDIDATES.

No candidate for second or subsequent examination shall be admitted thereto who has not satisfied his examiners at previous examinations; but all candidates who have passed any examination shall get credit for the same when presenting themselves upon a subsequent occasion.

EXAMINATIONS SINE CURRICULO.

Candidates who were in practice before 1878, whose names are on the Dental Register, and who are unable to furnish the certificates required by the foregoing regulations, may be admitted to examination if they shall fill in the schedule of application as follows:—

1. The name, age, and address.
2. A certificate of his moral and professional characters signed by two Registered Medical Practitioners and by two Registered Dentists.
3. The date of his commencing practice, and whether such practice has been carried on in conjunction with any other business, and if so, with what business?
4. Any certificate he may have of general education, or degree in Arts or Medicine.
5. The particulars of professional education.

The schedule of application, containing these particulars, shall be sent to the Registrar of the College, at least three weeks before the date of the examination; and the Council of the College shall then determine whether or not the candidate shall be admitted to examination for the Dental diploma. Such examination shall comprise the same subjects, and be conducted in the same manner as is herein set forth in reference to the Second and the Final Professional Examinations.

FEES.

The fee for this examination shall be £21; re-examination, if rejected, £10 10s.

DECLARATION TO BE TAKEN BY LICENTIATES.

The candidates entitled to receive the Dental diploma are required to attend upon such day as shall be notified to them, and to take a declaration.

They shall then sign the College roll, and shall receive their diplomas.

An enrolment fee of £1 is. is payable to the Registrar of the College on the issue of the diploma.

These bye-laws shall come into effect from and after 1st day of August, 1884. But the Council of the College reserve the right of making such modifications, as may seem to them reasonable, in favour of students who shall have commenced their studies before that date.

**REGULATIONS RELATING TO PROFESSIONAL EDUCATION
AND EXAMINATIONS FOR THE M.R.C.S. & L.R.C.P.**

SECTION I.

PROFESSIONAL EDUCATION.

Any candidate who desires to obtain both the Licence of the Royal College of Physicians of London and the Diploma of Member of the Royal College of Surgeons of England is required to comply with the following Regulations, and to pass the Examinations hereinafter set forth. [See Section II.]

Every such candidate who shall commence Professional study on or after the First of October, 1884, will be required, at the times prescribed in Section II. for the respective Examinations, to produce satisfactory evidence:—

1. Of having been Registered as a Medical Student by the General Medical Council. [See Regulations of the General Medical Council, page 20, also to be obtained of the Registrar, 299, Oxford Street, London, W.]

NOTE A.—Professional Studies commenced before Registration, except in the cases of Chemistry and Chemical Physics, Materia Medica, and Pharmacy, will not be recognised.

2. Of having been engaged in Professional Studies at least forty-five months, during which not less than three Winter Sessions and two Summer Sessions shall have

been passed at one or more of the medical Schools recognised by the two Colleges. One Winter Session and two Summer Sessions may be passed in one or more of the following ways:—

- (a) Attending the practice of a Hospital Infirmary, or other Institution recognised as affording satisfactory opportunities for Professional Study;
- (b) Receiving Instruction as a Pupil of a legally qualified Practitioner holding such a public appointment, or having such opportunities of imparting a practical knowledge of Medicine, Surgery, or Midwifery, as shall be satisfactory to the two Colleges;
- (c) Attending Lectures on one or more of the required subjects of Professional Study at a recognised place of instruction.

3. Of having received instruction in the following subjects:—

- (a) Chemistry, including Chemical Physics.
- (b) Practical Chemistry.
- (c) Materia Medica.
- (d) Pharmacy.

NOTE B.—The instruction in Practical Pharmacy must be given by a registered Medical Practitioner, or by a Member of the Pharmaceutical Society of Great Britain, or in a Public Hospital, Infirmary, or Dispensary.

4. Of having performed Dissections, at a recognised Medical School, during not less than twelve months.

5. Of having attended at a recognised Medical School:—

- (a) A course of Lectures on Anatomy during not less than six months, or one Winter Session.
- (b) A course of Lectures on General Anatomy and Physiology during not less than six months, or one Winter Session.
- (c) A separate Practical course of General Anatomy and Physiology during not less than three months.

6. Of having attended at a recognised Medical School:—

- (a) A course of Lectures on Medicine during not less than six months, or one Winter Session.

(b) A course of Lectures on Surgery during not less than six months, or one Winter Session.

(c) A course of Lectures on Midwifery and Diseases peculiar to Women during not less than three months.

NOTE C.—A Certificate must also be produced of attendance on not less than Twenty Labours, which Certificate must be signed by one or more legally qualified practitioners.

(d) Systematic Practical Instruction in Medicine, Surgery, and Midwifery, including:—

1. The application of Anatomical knowledge to the investigation of Disease.
2. The methods of examining various Organs and other Parts of the Body, in order to detect the evidence of Disease or the effects of Accidents.
3. The employment of Instruments and Apparatus used in diagnosis or treatment.
4. The examination of Diseased Structures, whether recent or in a Museum.
5. The Chemical Examination of Morbid products.
6. The performance of operations on the Dead Body.
7. Post-Mortem Examinations.

(e) A course of Lectures on Pathological Anatomy during not less than three months.

(f) Demonstrations in the *post-mortem* room during the whole period of attendance on Clinical Lectures.
[See Clause 8.]

(g) A course of Lectures on Forensic Medicine during not less than three months.

7. Of having attended, at a recognised Hospital or Hospitals, the Practice of Medicine and Surgery during Three Winter and Two Summer Sessions.

NOTE D.—No Metropolitan Hospital is recognised which contains less than 150, and no Provincial or Colonial Hospital which contains less than 100 Patients.

A three months' course of Clinical Instruction in the Wards of a recognised Lunatic Hospital or Asylum may be substituted for the same period of attendance in the Medical Wards of a General Hospital.

8. Of having attended, at a recognised Hospital or Hospitals, during nine months Clinical Lectures on Medicine, and during nine months Clinical Lectures on Surgery, and of having been engaged during a period of Three Months in the Clinical Study of Diseases peculiar to Women.

NOTE E.—These Clinical Lectures must be attended after the candidate has passed the Second Examination.

9. Of having discharged, after he has passed the second Examination, the duties of a Medical Clinical Clerk, during six months, and of a Surgical Dresser during other six months.

NOTE F.—These duties may be discharged at a General Hospital, Infirmary or Dispensary, or Parochial or Union Infirmary, recognised for this purpose, or in such other similar manner as shall, in the opinion of the two Colleges, afford sufficient opportunity for the acquirement of practical knowledge.

10. Of having received Instruction in the practice of Vaccination.

NOTE G.—The Certificate must be such as will qualify its holder to contract as a Public Vaccinator under the Regulations, at the time in force, of the Local Government Board.

Students are required to attend Examinations which are held in the several Classes.

N.B.—Exemption from any of the foregoing Regulations can only be granted by the Committee of Management.

SECTION II.

PROFESSIONAL EXAMINATIONS.

There are three Professional Examinations, called the First Examination, the Second Examination, and the Third or Final Examination, each being partly written, partly oral, and partly practical.

THE FIRST EXAMINATION.

The subjects of the First Examination are:—

Chemistry and Chemical Physics.

Materia Medica and Pharmacy.

Elementary Anatomy, and Elementary Physiology.

A candidate may take this Examination in three parts at different times, or he may present himself for the whole at one time.

A candidate will be admitted to the Examination on Chemistry, including Chemical Physics, Materia Medica, and Pharmacy, on producing evidence of having been registered as a Medical Student by the General Medical Council, and of having complied with the Regulations prescribed in Section I. Paragraph II. Clause 3, *or he may take Materia Medica and Pharmacy as part of the Second Examination*; but he will not be admitted to the Examination on Elementary Anatomy, and Elementary Physiology, earlier than the end of his first Winter Session at a Medical School.

The Fees for admission to the First Examination are £10 10s.

THE SECOND EXAMINATION.

The subjects of the Second Examination are:—

Anatomy.

Physiology.

A candidate may present himself for Examination in either of these Subjects or Parts separately, or in both at one time.

A candidate will be admitted to the Second Examination after the lapse of not less than six months from the date of his passing the First Examination, on producing evidence of having completed, subsequently to registration as a Medical Student, eighteen months of professional Study at a recognised Medical School or Schools, and of having complied with the Regulations prescribed in Section I. Clauses 4 and 5.

The Fees for admission to the Second Examination are £10 10s.

THE THIRD OR FINAL EXAMINATION.

The subjects of the Final Examination are:—

Medicine, including Therapeutics, Medical Anatomy, and Pathology.

Surgery, including Surgical Anatomy and Pathology.

Midwifery, and Diseases peculiar to Women.

Questions on Forensic Medicine and Public Health will be included in the Third or Final Examination.

A candidate may present himself for examination in these Three Subjects or Parts separately or at one part.

A candidate will be admitted to the Third or Final Examination on producing evidence—

1. Of being Twenty-one Years of age.
2. Of having passed the Second Examination.
3. Of having studied Medicine, Surgery, and Midwifery, in accordance with the Regulations prescribed in Section I. Clauses 2 and 6 to 10.

The Colleges do not admit to either Part of the Third or Final Examination any candidate (not exempt from Registration) whose name has not been entered in the Medical Students' Register at least forty-five months, nor till the expiration of two years after his having passed the Second Examination.

The Fees for admission to the Third or Final Examination are £15 15s.

Every candidate who shall have passed the Third or Final Examination, is, subject to the Bye-laws of the two Colleges, entitled to receive—

The License of the Royal College of Physicians of London,
and

The Diploma of Member of the Royal College of Surgeons
of England.

Forms of the required Certificates may be obtained of the Registrar of the Royal College of Physicians, or of the Secretary of the Royal College of Surgeons.

SPECIAL DENTAL SCHOOLS.

THE DENTAL HOSPITAL OF LONDON, LEICESTER SQUARE.

DENTAL ANATOMY AND PHYSIOLOGY.

By Arthur Underwood, M.R.C.S., L.D.S.Eng.—On Wednesdays and Saturdays, at 8 a.m., during the Summer Session.

DENTAL SURGERY AND PATHOLOGY.

By S. J. Hutchinson, M.R.C.S., L.D.S.Eng.—On Tuesdays and Thursdays, at 8 a.m., during the Summer Session.

DENTAL MECHANICS.

By Joseph Walker, M.D., &c.—On Wednesdays, at 5 p.m., during the first half of the Winter Session.

METALLURGY.

By Prof. A. K. Huntington.—On Tuesdays and Fridays, at 12 o'clock, during the first half of the Winter Session.

Fees for two years' Hospital Practice and the Lectures, £31 10s.

MORTON SMALE, *Dean*.

NATIONAL DENTAL HOSPITAL AND COLLEGE,
GREAT PORTLAND STREET.

DENTAL ANATOMY AND PHYSIOLOGY.

By Thomas Gaddes, L.D.S.Eng. and Edin.—On Tuesdays and Thursdays, at 7 p.m., during October, November and December.

DENTAL SURGERY AND PATHOLOGY.

By Willoughby Weiss, L.D.S.Eng.—On Tuesdays and Thursdays, at 6 p.m., during May, June and July.

DENTAL MECHANICS.

By Harry Rose, L.D.S.Eng.—On Mondays, at 7 p.m., during January, February and March.

DENTAL METALLURGY.

—On Tuesdays, at 6 p.m., during January, February and March.

OPERATIVE DENTAL SURGERY.

By W. St. George Elliott, M.D., D.D.S.—On Wednesdays, at 7 p.m., during November and December.

DENTAL MATERIA MEDICA.

By Charles Glassington, M.R.C.S., L.D.S.Eng.—On Mondays, at 7 p.m., during October, November and December.

DEMONSTRATIONS IN DENTAL MECHANICS.

By W. R. Humby, L.D.S.Eng.—On Wednesdays, at 7 p.m., during January, February and March.

THE ELEMENTS OF HISTOLOGY.

By Thomas Gaddes, L.D.S.Eng. and Edin.—On Wednesdays and Fridays, at 6 p.m., during May, June, and July.

Fees for two years' Hospital Practice and all the Lectures, £25 4s.

THOMAS GADDES, *Dean*.

OWEN'S COLLEGE AND THE VICTORIA DENTAL HOSPITAL, MANCHESTER.

Instruction adapted to the requirements of students preparing for the Dental Diploma of the Royal College of Surgeons of England and other licensing bodies is now given by Owen's College, in conjunction with the Victoria Dental Hospital, Manchester.

The Lecturers on Dental subjects are :—

DENTAL ANATOMY AND PHYSIOLOGY.

By Andrew M. Paterson, M.D., M.R.C.S.—On Tuesdays, at 11 a.m., and Fridays, at 12 noon, during the Summer Session.

DENTAL SURGERY.

During the Summer Session.

DENTAL METALLURGY.

By C. A. Burghardt, Ph.D.—On Thursdays, at 2.30 p.m., during the Summer Session.

DENTAL MECHANICS.

By Thomas Tanner, L.D.S.Eng.—On Thursdays, at 5 p.m., during the Winter Session.

The fee for two years' Dental Hospital practice is £12 12s.

The cost of the necessary courses for qualification (exclusive of the charge for parts in the dissecting room), together with the Infirmary and the Dental Hospital practice, is £79 12s. 6d.

Dr. PARSONS SHAW, *Warden*.

QUEEN'S COLLEGE, BIRMINGHAM, AND BIRMINGHAM DENTAL HOSPITAL.

The teaching of Dentistry is now undertaken by the Queen's College, acting in association with the Birmingham Dental Hospital and the Birmingham Clinical Board, so that Students may fully qualify themselves for the Dental Diploma of the Royal College of Surgeons.

The Dental Hospital is centrally situated, near the College, and is open daily (Sundays excepted). The number of patients treated in 1883 was upwards of 7,000.

DENTAL ANATOMY AND PHYSIOLOGY.

By F. R. Batchelor, L.D.S.I.—On Thursdays, at 5 p.m., during the Winter Session.

DENTAL SURGERY AND PATHOLOGY.

By Thomas Hawkins, M.R.C.S.—On Fridays, at 5 p.m., during the Winter Session.

DENTAL MECHANICS.

By W. T. Elliott, L.D.S.Edin., F.C.S.—On Wednesdays, at 5 p.m., during the Summer Session.

DENTAL METALLURGY.

By W. A. Tilden, F.R.S., D.Sc.—This Class will be held at Mason College, at 2.30 p.m., from October till Christmas.

A Composition Fee of Sixty Guineas, payable in one sum, or in two sums, viz.: Forty Guineas at the beginning of the first year, and Twenty Guineas at the beginning of the second year of studentship, admits to the full curriculum required for the Dental Diploma (inclusive of the necessary Hospital Practice). Any additional attendance will be charged for according to the general conditions.

The Rev. W. H. POULTON, M.A., *Warden.*

UNIVERSITY COLLEGE, LIVERPOOL, & LIVERPOOL
DENTAL HOSPITAL, MOUNT PLEASANT.

The entire curriculum can be completed at these two Schools.

DENTAL ANATOMY AND PHYSIOLOGY.—By E. T. Paul, F.R.C.S.

DENTAL SURGERY.—By E. J. M. Phillips, M.R.C.S., L.D.S. Eng.

DENTAL MECHANICS.—By E. A. Connell, L.D.S. Eng.

DENTAL METALLURGY.—By J. Roysdon, L.D.S. Eng.

FEES FOR DENTAL HOSPITAL PRACTICE.—Five Guineas per annum for all Students who are not taking out the full curriculum; Four Guineas for full Students at these schools.

COMPOSITION FEE.—A payment of Fifty Guineas on entrance, or in two equal instalments (one-half on entrance and the remainder within twelve months), entitles the Student to attendance on all Lectures and Demonstrations (Medical and Special) required for the License of the Royal College of Surgeons of England. The fees for the Practice of the two Hospitals amount to £23 2s. The total expenditure for the whole curriculum is £75 12s.

FREDERICK ROSE, *Registrar.*

DENTAL DISPENSARY AND SCHOOL, OCTAGON, PLYMOUTH.

DENTAL ANATOMY.—By F. H. Balkwill, L.D.S.Eng.

DENTAL PHYSIOLOGY.—By C. Spence Bate, F.R.S., &c.

DENTAL MECHANICS.—By W. V. Moore, L.D.S.Eng.

The Fee for Lectures and Dispensary Practice is £23 2s.

E. G. BENNETT, *Hon. Sec.*

DENTAL HOSPITAL OF EXETER, BEDFORD CIRCUS.

Attendance on the practice of this Hospital is recognised by the Royal College of Surgeons of England as qualifying for their Dental Diploma. Pupils of any Member of the Staff, or other Registered Practitioner (being a Life or Annual Governor), are permitted to attend the practice of the Hospital, subject to the approval of the Medical Sub-Committee, on payment of Five Guineas annually to the funds of the Institution.

HENRY B. MASON, *Hon. Secretary.*

EDINBURGH DENTAL HOSPITAL AND SCHOOL, CHAMBERS STREET.

DENTAL ANATOMY AND PHYSIOLOGY.

By Andrew Wilson, L.D.S.Edin.—On Tuesdays and Fridays, at 8 p.m., commencing in November. The course will consist of Twenty-four Lectures.

DENTAL SURGERY AND PATHOLOGY.

By George W. Watson, L.D.S.Edin.—On Tuesdays and Fridays, at 8 p.m., during the Summer Session. The course will consist of Twenty Lectures.

MECHANICAL DENTISTRY.

By W. Bowman Macleod, L.D.S.Edin.—On Wednesdays, at 8 p.m., commencing in November.

PRACTICAL MECHANICS.

Assistant Demonstrator.—J. Stewart Durward, L.D.S.Edin. The Demonstrations will be spread over the two years of Hospital Practice, and will be given as occasion serves.

Fees : For Hospital Practice, £15 15s. ; Lectures, £9 15s. ; total, £25 10s. This does not include the fee of £2 4s. for second courses of Lectures required by the Royal College of Surgeons of England.

W. BOWMAN MACLEOD, *Dean*.

GLASGOW DENTAL HOSPITAL AND SCHOOL,
56, GEORGE SQUARE.

DENTAL ANATOMY AND PHYSIOLOGY.

By J. C. Woodburn, M.D., L.D.S.Glas.—On Wednesdays and Saturdays, at 8 a.m., during Summer Session.

DENTAL SURGERY AND PATHOLOGY.

By J. R. Brownlie, L.D.S.Eng.—On Tuesdays and Fridays, at 8 a.m., during Summer Session.

DENTAL METALLURGY.

By Rees Price, L.D.S.Eng.—On Wednesday Evenings, at 7 p.m., during Winter Session.

MECHANICAL DENTISTRY.

By W. S. Woodburn, L.D.S.Glas.—On Tuesdays, at 7 p.m. during Winter Session.

Fee for two years' Hospital Practice is £12 12s. ; for the four courses of Dental Lectures, £3 3s. each.

TOTAL FEE for Special Lectures and Hospital Practice required by the curriculum is £23 2s., of which £15 15s. may be paid on entering, and £7 7s. at the beginning of the second year.

Prospectus on application to

J. R. BROWNLIE, *Dean*.

DENTAL HOSPITAL OF IRELAND, YORK STREET,
DUBLIN.

SUMMER SESSION.

DENTAL ANATOMY AND PHYSIOLOGY.—By Daniel Corbett, Jun., A.B., F.R.C.S.I.

DENTAL SURGERY AND PATHOLOGY.—By A. W. W. Baker, M.B., Ch.M.

WINTER SESSION.

DENTAL MECHANICS.—By Theodore Stack, M.D., F.R.C.S.I., D.M.D.

METALLURGY.—By Charles Cameron, M.D., F.R.C.S.I.

In the Mechanical Laboratory each Student is allotted his own bench, where practical instruction is carried out.

Total Fees, £31 10s.

THEODORE STACK, M.D., *Dean*.

GENERAL MEDICAL SCHOOLS.

BARTHOLOMEW'S HOSPITAL, SMITHFIELD, E.C.

Fee for General Subjects for Students of Dental Surgery:—
First Winter, 31½ guineas; First Summer, 31½ guineas; or a
single payment of 63 guineas. Dr. NORMAN MOORE, *Warden*.

CHARING CROSS HOSPITAL, W.C.

The Composition Fee for Dental Students is £42 2s. This may
be paid in two instalments of £22 2s. and £20, at the commence-
ment of each Winter Session respectively.

Dr. J. MITCHELL BRUCE, *Dean*.

GUY'S HOSPITAL, BOROUGH, S.E.

Fee for attendance on the Hospital Practice and Lectures
required for the Dental Diploma of the College of Surgeons, 63
guineas, or in two annual instalments of 40 guineas and 23 guineas.
The above fee does not include £1 10s. for Practical Chemistry.

Dr. F. TAYLOR, *Dean*.

KING'S COLLEGE, STRAND, W.C.

No special arrangements are made for Dental Students.

Prof. CURNOW, *Dean*.

LONDON HOSPITAL, MILE END, E.

Composite Fee for Dental Students:—Hospital Practice and
Lectures, £42. This does not include the Fee of £2 2s. for
Practical Chemistry.

MUNROE SCOTT, *Warden*.

MIDDLESEX HOSPITAL, BERNERS STREET, W.

Students who intend to become Licentiates in Dental Surgery
of the Royal College of Surgeons are admitted to attend the
requisite Courses of Lectures and Hospital Practice on payment
of a fee of 40 guineas, in one sum on entrance, or by instalments
of £30 on entrance and £15 at the beginning of the second Winter
Session.

A. PEARCE GOULD, *Dean*.

ST. GEORGE'S HOSPITAL, GROSVENOR PLACE, S.W.

Fee for General Subjects required for the Diploma in Dental Surgery, including Practical Chemistry, £55; payable in two instalments:—First year, £30; Second year, £25.

Dr. WADHAM, *Dean*.

ST. MARY'S HOSPITAL, PADDINGTON, W.

Entrance Fee to the General Hospital Practice and Lectures required for the examination in Dental Surgery at the Royal College of Surgeons, England, £55; payable in two instalments:—First year, £30; Second year, £25.

GEORGE P. FIELD, *Dean*.

ST. THOMAS'S HOSPITAL, ALBERT EMBANKMENT, S.E.

The Fee for attendance on the General Subjects required of Students in Dental Surgery is, for the two years, £55; or by instalments, £50 for the first year, and £10 for the second year.

G. RENDLE, *Secretary*.

UNIVERSITY COLLEGE, GOWER STREET, W.C.

No special arrangements are made for Dental Students.

Prof. BERKELEY HILL, *Dean*.

WESTMINSTER HOSPITAL, BROAD SANCTUARY, S.W.

The Fees for the General Surgical Practice and Lectures required for the Dental Diploma of the Royal College of Surgeons may be paid in one of two ways, viz.:—1. In one payment on entrance, £50. 2. In two payments of £32 10s. and £20, to be made respectively at the commencement of each academic year. These payments include the Library Fee, and entitle the Student to attendance on the Tutorial Classes.

Dr. DE HAVILLAND HALL, *Dean*.

SCHOOL OF MEDICINE, SURGEONS' HALL, EDINBURGH.

The Fees for the General Subjects (including practice at the Royal Infirmary) required of Dental Students, according to the curriculum of the Royal College of Surgeons of Edinburgh, amount to £38 10s.

STEVENSON MACADAM, *Secretary*.

ANDERSON'S COLLEGE, GLASGOW.

The Fees for the General Subjects required of Dental Students, as prescribed by the curriculum of the Faculty of Physicians and Surgeons of Glasgow, amount to £25 14s. 6d. And the Fees at the Dental School for the special portion of the curriculum, including £12 12s. for Dental Hospital Practice, are £23 2s.—total, £48 16s. 6d.

Dr. A. M. BUCHANAN, *Dean*.

**INTRODUCTORY LECTURE TO THE COURSE GIVEN ON
DENTAL MECHANICS DURING THE
SUMMER SESSION, 1886,**

IN THE DENTAL DEPARTMENT OF QUEEN'S COLLEGE, BIRMINGHAM.

By WILLIAM T. ELLIOTT, L.D.S.Edin., F.C.S.

GENTLEMEN,—Before we consider in detail the special subject which these lectures will embrace, I propose to make a few remarks of an introductory character, which I trust will prove of value, and the observance of which must very materially affect your future success.

The teeth, I need scarcely say, require some attention and treatment during the whole seven ages of man's life, the "mewling and puking in the nurse's arms" being not unfrequently the result of erupting teeth; but it is more often in the later stages that you will have to exercise your skill in this subject which we have under consideration in these lectures, although the conditions of life may necessitate the adaptation of dentures at an early age, and sometimes before development has entirely ceased. Dental practice, by a general assent, is divided into two parts: the one including all surgical operations and all methods for the preservation of the natural teeth; the other, which we have now to consider, includes the construction of all appliances for the treatment of deformities of the mouth, but more especially treating of the insertion of artificial teeth.

The term mechanical dentistry, however, may be regarded as somewhat incongruous, for I wish to have you remember that a mechanic, properly so called, is one who works by some fixed rule in order to produce a perfect uniformity in his results. Although in one sense the skill exercised in every operation upon the teeth

is mechanical, it is not so in the broad sense in which it should be regarded as an integral part of a prosthetic art. You can be guided by no fixed rules, for you will find there are very few cases that are precisely identical. Thus we see that dental mechanics embrace the consideration of the means for restoring the impaired functions of speech and mastication, as well as the equally important correlation of the denture to the physical characteristics of the patient. Dentistry, as you will find stated upon your diplomas, is a science and an art. It has now a justifiable claim to be considered a science, although empiricism very largely exists: it is also an art. In former days among the ancient Greeks all works which involved skill were considered works of art; but we have terms of distinction—we have the ideal arts, those that excite the imagination, that call into action the affections; in fact, that tend to develop our higher emotions. We have, too, the mechanic arts: these are of more direct practical value, for they contribute to our physical comfort. It is mechanic art, therefore, which we have to consider,—one that certainly is necessary for health and comfort.

In the consideration of an artificial denture, all that relates to its appearance belongs to art, and all that affects its utility is controlled by mechanism, so that what you must endeavour to attain in their construction is practical utility based upon these words, "*Ars est celare artem*," for it is an imitation of nature, and not an attempt to improve upon her, that you must seek. I need scarcely remind you that the study of the human body, or any special portion of it, is the highest art, and there is no part more directly subject to controlling influences than the mouth, for it may be made either agreeable or repulsive, as we may wish. The means by which we can do this is now very different to what it was formerly. When it was first attempted to restore the alveolar processes it was done with blocks of ivory carved accordingly, and those parts which represented the gum were stained with a vegetable dye; then plates were made in metal, and for a long time it was the only base in use. Afterwards, vulcanite was brought into use; at first this was in a very imperfect state, and for some time it could be made of no nearer natural colour than vermilion, until pink rubber was introduced. Then celluloid was used; it is of an extremely beautiful colour, but, as we shall find I think, of no permanent value; and lastly, continuous gum work

has been brought into prominence, which for colour is so true to nature that it will bear the closest scrutiny ; but we shall consider the relative value of these materials hereafter. We shall also consider the various methods of pivoting teeth ; the construction of splints for fractured maxillæ, and the methods of general value for the treatment of cleft palate ; likewise the treatment of irregularities of the teeth.

Having now explained what is required of you in the study of the subject, I wish to make a few suggestions concerning the treatment of your patients.

1. Whenever possible, allow a napkin to intervene between your fingers and the lips or even the face of your patient.

2. Do not arrive too quickly at any conclusion from a statement of your patient, nor allow yourself to be entirely guided by their wishes, if you think it undesirable.

3. Use towards your patient as much gentleness as is consistent with thoroughness, for a gentle touch will frequently enable you to arrive at a correct conclusion, where roughness, in the case of a nervous patient, would necessitate a more prolonged examination.

4. Cultivate, as far as you can in your hospital practice, the means and expression for the management of children, for without doing this the proper treatment of their teeth is quite impossible.

5. Aim at establishing between your patient and yourself a feeling of confidence. Kindness carries with it an influence which always tells ; it is far more powerful than loudness or force. Gentleness, candour, and at the same time firmness, are compatible with those qualities which will inspire this confidence.

Treat your hospital patients as you hope to treat your private patients (for I well remember this advice being given me in the early part of my student's career, and I have always remembered it, I feel sure, to my advantage). This will enable you to habituate your demeanour and will give a colour to your actions and manners which will prove of the highest value ; for little courtesies, separately, appear to be of little intrinsic value, but they acquire an importance from repetition and by accumulation ; for it is, believe me, the observance of such small and apparently insignificant details that leads to success. Unfortunately, the public know very little indeed about diplomas, but it is quite certain they will appreciate and recognise that courteous bearing upon which

success does largely depend, and in this respect you will unconsciously reflect honour upon your profession.

Conscientious dentistry, I would have you remember, is the preservation and restoration, as far as is possible or judicious, of all the parts under your treatment—the well-being of your patient being the first consideration.

Adopt, therefore, those means by which you will give as little pain or discomfort as is possible, for you will have very largely to deal with a pathological or perhaps a psychological factor which augments that which of itself need cause no fear—a pain quite *sui generis*.

As a matter of course, your time will be spent in mitigating suffering and in making life more enjoyable, for even though brought in contact with a small part only of the great art of healing, still you will find there are many little kindnesses you may constantly render for which your only reward will be the gratitude or friendly regard of your patient; differing in detail only from that of the surgeon, but identical with regard to its true ends, for “utility alone,” says Mr. Tomes, “is the excuse for the dentist’s existence;” and it is so, for many are thrown entirely on our resources: we have enabled many to continue their work far into the edentulous age of life, and, as I have said, we can make life more enjoyable; so that your range of usefulness, you will see, may be a very extensive one.

Dentistry has been in existence thousands of years. It was known to and practised by the earlier civilized nations. The Egyptians made it a specialty; the Greeks also were acquainted with some mechanical means for treating cleft palate; yet, however, it was not until the sixteenth century that the first work on dentistry was published by Ambrose Paré, and in 1776 the first paper was read on artificial teeth before the French Academy, so that it is only within recent years there has appeared any literature upon our subject.

In former days, and even until within a very recent date, artificial teeth were merely considered of value for a less reason than health—they were considered in the same light as jewellery; but it seems evident that as civilization advances and as the true and close relationship of the teeth to health and comfort is more widely appreciated and understood, so this mistaken notion of their value must explode.

Now, gentlemen, lectures are a means for you to acquire knowledge, and are intended to be a guide through the more important parts of your studies. They are very important, but they cannot of themselves impart to you everything you require ; you must think for yourselves, you must accurately and thoroughly carry through all you undertake, and you must further depend upon those facilities afforded you elsewhere for the acquisition of thorough practice ; but remember this, the points that are placed before you in your lectures may be made progressive if you so desire it.

Allow me to remind you that one of our writers has said "every person has two educations, one which he receives from others and the other which he gives to himself." This latter means a training of the mind to observe, to think, to note ; and I pray you do not let your notes or observations be confined to this your chosen profession, for they must extend far wider than this if you wish to attain the standard of other professional men.

There is no calling in life where you may safely rely upon others, for the world is far too busy for that to be true, and that old saying of Socrates is even now very true indeed, "Let him that would first move the world, move himself," for I am sure if you rightly estimate the advantages you possess, if you will but recognise the importance of the most minute attention to detail, it will materially assist you to form this education of which I speak, and to acquire that which it possesses, viz., self-reliance. But you will have failures, yet they need cause you no discouragement, for I feel sure you can never make a mistake without learning something of advantage. Regard these difficulties only as periods of new effort, in order to attain the particular object you have in view.

These things that I have placed before you largely tend to make up the sum of life, but

" Some are born great,
Some achieve greatness,"

and many who have lived in the past or who have achieved distinction clearly indicate to you that

" Honour and shame from no condition rise.
Act well your part ; there the honour lies."

Success, therefore, lies with you ; it means steady day to day work, wisely directed, and with your object in view. It will require of you, no doubt, much self-devotion, but if you are resolute of will, if you possess an undeviating purpose, it is certain you may

attain that which you may aspire to, and perhaps you can scarcely estimate what that attainment might be; but on the other hand, if you neglect your work, the great wave of progress will pass over you, and you will be swamped in your struggle for existence.

Your real power is not in your diploma alone—that is an accessory requirement that has become necessary—it is involved in your character and in your conduct. It is in that which you may deserve; which you may command; that which acknowledges an Ever-guiding Power: it is in a true appreciation of that title by which I have addressed you, the possession of which will most surely give you an irresistible claim to public and professional confidence.

**CASE OF PYORRHŒA ALVEOLARIS, CHRONIC PHARYNGITIS,
AND NECROSIS OF THE OSSA NASI.**

By CHARLES F. FORSHAW, D.D.S., F.R.M.S.

MRS. E., ætat 56, and the mother of fourteen children, a thin, anæmic-looking woman, consulted me last November as to the state of her mouth. On examining, I judged her to be suffering from nasal catarrh associated with pyorrhœa alveolaris (evidently not caused by hereditary transmission, as I questioned her at length on her ancestry, but from a lack of cleanliness, which resulted in salivary incrustations on the buccal surfaces of the molars and cuspids at least one-sixth of an inch in thickness) which extended to the ethmoid and sphenoid bones, accompanied with swelling and inflammation of the mucous membrane of the palate. Her breath was intolerably loathsome, and to render the case more pitiable, she seemed unaware that it differed from any other person's. As she appeared quite surprised when I, in as delicate a manner as possible, broached its fœtor to her, I felt persuaded that, apart from the dental disease, and the several abscess cavities from which the disgusting odour of the septic pus escaped, she must be afflicted with some other obnoxious malady which was contaminating the respiratory organs, and thus rendering the expired air so horribly foul. I therefore carefully examined the throat and nose, and found the throat slightly inflamed, but nothing else, though the nose was somewhat necrosed, and on mentioning it to my patient, she said that a short time ago her doctor had taken a piece of "dead bone" out. To a great extent, no doubt, the fœtid exhalations were due to this.

Acting on the advice of Dr. Bödecker (as reported on p. 457 of Vol. IV. of the RECORD), I removed all the calculus from the teeth I thought I could save, and extracted the rest.

When the bleeding, of which there was very little, had almost ceased, I syringed the mouth with equal parts of liq. hyd. perchlor. and water, and asked the patient to call again in a week. At the end of that time she seemed to be making fairly good progress towards recovery, still the necrotic tissue was distinctly visible. I then applied acid carbol. 1 in 60 with a saturated solution of zinc chloride for a few minutes thrice weekly for a month, which resulted in the entire disappearance of all traces of necrosis. Shortly before Christmas I thought her mouth to be sufficiently healthy to wear an artificial denture, so I decided to make her a necessary quantity—upper and lower. For about two months all went well—the mouth seemed to conform readily to the denture, especially the palatine surface—but at the end of that period she returned, complaining of looseness. The alveolar ridge was moderately hard, but the central portion of the dental arch soft, and I noticed that the concretion of tartar was just beginning to form on the vulcanite, especially the lower; and she complained of a distressing pain, with great weight in her stomach, and very severe pain in her throat. Once more examining the latter, I found the tonsils and pharynx greatly inflamed, while the posterior pillar of the soft palate seemed much swollen. I therefore determined to ask the advice of an old friend—A. Rabagliati, Esq., M.A., M.D., F.R.C.S., senior honorary surgeon to the infirmary—as to the best means to remedy the recurrence of the calculus, as I was afraid that were I to lose sight of my patient, the remaining natural teeth would soon be like their former neighbours—lost, and at the same time to get his opinion as to the continuing and increasing loathsomeness of her breath, of which she seemed still tranquilly and serenely unconscious. Accordingly we went together to his house, and after examination, he diagnosed necrosis of the ossa nasi and chronic pharyngitis, and prescribed small doses of acid. nitric. dil. t.d. s. a. c. (this, of course, for stomach), and for her throat a paint of sodæ hyposulph. and glycerin nocte et mane. This had the effect of somewhat lessening the obnoxious breath, and she again consulted him in three days, when he altered the medicine to minim doses of liq. hydrarg. perchlor. and liq. arsenici hydrochlor. om. 4 hor. alternately, and to continue

the throat paint. As for the nose (in his opinion that was the primary cause of the offensive and malodorous exhalations), the remaining necrosed part would shortly be thrown off by exfoliation, so he asked the patient to call again in a week. I, in the meantime, asked him if it would be better that, for a few days, she should desist from wearing the teeth, a plan in which he entirely coincided. When my patient again saw him, he told me when she had left that he thought there might be a syphilitic taint, but as he had asked her if she had ever noticed any spots on her chest or body, and she had replied in the negative, as also to a few questions which might satisfy him as to whether there was any history of syphilis or not, this time he gave her a lotion for the nose of pot. bicarb. and a mixture of potass. iodid. and glycerin. I saw my patient during the week, and from her learnt that her nose had been a source of great trouble to her for the past fourteen years, and that it had affected the right eye, causing it to water; but that, having been at the Eye and Ear Hospital, and having consulted nine local medical men, from whom she had derived no lasting benefit, she had become somewhat disheartened, and thought that she would have to end her days with no prospect of ever obtaining a thorough cure. Most of the surgeons she had seen had ordered her Condyloma; this, however, had had but a momentary effect. The next week the doctor passed a catheter up each nostril, reaching each time to the pharynx, which caused a slight bleeding mixed with a thick slimy matter, and himself syringed the nose. On her next visit she complained of sickness and faintness, which evidently arose from the discharge from the ossa nasi. On her pharynx and fauces was congregated a large quantity of yellow mucous, which the doctor sponged off and then thoroughly washed.

Her next visit was a fortnight after, during which time she had been taking the mist. pot. iod., and this time she was considerably better, more so in fact than she had been for years. On her previous visit, after the mucous had been removed from the pharynx it was very hard and had exactly the appearance and colour of tortoiseshell; now it was soft, and, being almost better, was of a healthy colour, and but for a little redness was undistinguishable from the pharynx of a healthy person. The nose, too, was not discharging in anything like the quantity it had previously done, and in every respect very much improved. On June 19th the discharge had entirely ceased, the posterior wall of the pharynx

was soft and natural, though rather shiny looking. This time the doctor prescribed dec. sarzæ in addition to the pot. iodid. to be taken at 12 noon and 8 p.m., and small doses of potass bichrom. at 8 a.m. and 4 p.m. He last saw her on July 17th, when he pronounced her completely cured. Her breath had now the smell of a healthy person; her nose, though a little out of shape with having exfoliated, could not by an outsider be detected from any other; her gums showed no signs of ever having been diseased, and the pharynx seemed covered with a new growth of mucous membrane.

Now, before expressing an opinion as to this complicated case, I should like to have the opinion of some of the readers of this popular journal—1st, as to whether the necrosis of the nose caused the pyorrhœa alveolaris; 2nd, if it did, did this cause the chronic pharyngitis? I should have said that the lachrymal duct, for the closure of which she underwent treatment at the Eye and Ear Hospital, has now, though not specially treated, opened out, and she no longer suffers from the eye watering.

PYORRHŒA ALVEOLARIS.

LECTURE BEFORE THE CLASS OF THE NEW YORK COLLEGE OF DENTISTRY,
SESSION OF '85 AND '86.

By ALFRED R. STARR, M.D., D.D.S.

(Abstract from *Independent Practitioner*.)

PYORRHŒA ALVEOLARIS, sometimes called Rigg's disease, catarrhal or suppurative gingivitis or ulitis, and alveolar pyorrhœa, is a disease of which much has been written, but as yet little is known. It is described by some as a disease characterized by a flow of pus from the tooth sockets. The effect upon the gums and alveoli differs very materially from the usual results of salivary calculus, in that in this disease the ulcerative process or retrograde metamorphosis is most marked in the pericementum and alveolus, while the gums are comparatively free. In this affection the destruction and separation of the pericementum and the absorption of the alveoli are greater and more rapid than the recession of the gums, thus resulting in the formation of deep pockets between the gums and the teeth, from which pockets exudes an ichorous or sanious discharge. In cases of salivary calculus proper, with no

secondary sanguinary deposit, the recession of the gums, destruction of the pericementum and absorption of the alveolus occur slowly, and the process is limited to the immediate vicinity of the deposit; so that if we go a little beyond the point of contact of the deposit with the gum, we will find the pericementum and alveolus in quite a normal condition.

This is the case, even when the deposit has encroached upon the alveoli almost to the apices of the roots. Even in these cases we may have a fetid, sanious discharge, but instead of proceeding from deep pockets it comes from the tissues in the immediate vicinity of and directly underlying the deposit. If any pockets are formed in these cases of salivary calculus they are very shallow, and the destruction of the pericementum and absorption of the alveoli show little tendency to increase any more rapidly than the ulceration and recession of the gums. In pyorrhœa alveolaris there is frequently no recession of the gums, little or no salivary calculus about the necks of the teeth, and yet we have extensive involvement of the pericementum and alveolus, and usually, if not always, the presence of the dark or sanguinary variety of tartar on the roots.

We sometimes see the manifestations of these two affections, viz., salivary calculus and pyorrhœa alveolaris, on one and the same tooth. In the case of salivary calculus proper, the deposit precedes and causes destruction of the pericementum, while in this disease some peculiar irritation of the pericementum precedes and causes calcareous deposit.

The etiology of pyorrhœa alveolaris is very obscure. Authorities are very evenly divided as to whether the causes are constitutional or local. Some regard it as a localization of a systemic debility, while others believe it to be due entirely to local causes, and amenable to local surgical treatment. Some attribute the occurrence of the disease entirely to the presence of tartar and its effects upon the surroundings of the teeth, while others say that while tartar is usually present it is only a concomitant or sequence of the affection, and never the cause. Those who maintain the latter view declare that the disease sometimes occurs without the presence of any tartar.

Constitutional dyscrasia (hereditary or acquired), extreme density and low degree of vitality of the teeth, suppression of habitual secretions, catarrhal inflammation, the presence of

bacteria, of foreign deposits (salivary, serumal or sanguineous), and local irritation from the use of wedges, ligatures, rubber dam, &c., have been assigned as causes.

The influence of heredity in pyorrhœa is often quite marked, the disease being transmitted through several generations. Cases have been noticed in which children born before the acquisition of the disease by the parent or parents have been exempt, while those born subsequently have developed it at quite an early age. Among the cases due to acquired constitutional predisposition may be cited those caused by mercurialization, or some peculiarity of diet, nutrition, or nervous influence.

Pyorrhœa alveolaris very frequently follows mercurial salivation. The statement has been made that pyorrhœa alveolaris never occurs except in persons who have been salivated, but this theory has not been generally accepted, and I do not believe it is founded on fact.

It is believed by many that excessive use of chloride of sodium will sometimes cause pyorrhœa alveolaris. Some authors assert that imperfect elimination of urea is its principal constitutional antecedent.

In support of the theory that suppression of habitual secretions may aggravate or incite this affection, Dr. Rehwinkel cites the case of a young lady aged eighteen, otherwise healthy, and with no accumulation of salivary calculus, in whom the teeth became very loose, presumably from the fact that the menses had never been established. The extraction of two or three of her teeth, although they were very loose, produced violent and persistent hæmorrhage. Local treatment and hygienic measures checked the progress of the malady, and when, after some months, menstruation was established, the disease disappeared and the remaining teeth became firm. Dr. Patterson has said that he believes the disease to be of a catarrhal nature, and he also inclines to the belief that the calcular deposits are simply the result or sequence of the disease. Dr. Patterson states that in the cases he has observed he has found co-existing nasal, pharyngeal, or laryngeal catarrh (generally combined) in every instance. He believes the disease is generally caused by infection from a pre-existing catarrh of the nose or throat, but states, also, that the catarrhal condition of the mouth may originate in that cavity, and not be due to infection, or (I think he should have said) extension of the disease, at all.

These primary cases, he thinks, are most apt to occur in those who are in the habit of breathing through the mouth. In support of his theory Dr. Patterson cites the following points of similarity in the pathology of the two diseases, viz.:—Nasal catarrh and pyorrhœa alveolaris.

1st. The similar appearance of the affected mucous membrane in both diseases and in the various stages of each.

2nd. The identical character of the effusions, viz.: first serous, containing numerous epithelial scales, and then becoming filled with pus and blood corpuscles.

3rd. The infectious nature of both diseases, nasal catarrh being contagious and sometimes epidemic, pyorrhœa alveolaris frequently showing a tendency to spread from one tooth to the next, until all may be affected.

4th. The similar burrowing of pus in each trouble.

5th. The tendency in each to destruction of periosteum and underlying bone.

6th. The calcareous deposits occurring in each disease. (Deposits of phosphate and carbonate of lime are sometimes formed in cases of nasal catarrh.)

It is possible that the predisposing or constitutional cause of pyorrhœa alveolaris may, in some instances, be a tendency to catarrhal inflammations; but I do not believe, as does Dr. Patterson, that this disease is transmitted from a pre-existing catarrh of the nose or throat. It is true we can have, according to the medical authorities, an extension of catarrhal inflammation from the nose, throat, or even from the stomach, to the mouth, and we then have acute or chronic oral catarrh, or catarrhal stomatitis; but in such cases the process is a general one, and affects not only the mucous membrane of the gums, but also that of the lips, cheeks, tongue, &c., which condition we do not have in pyorrhœa alveolaris. Dr. Patterson states that both nasal catarrh and pyorrhœa alveolaris are of an infectious nature, and further states that text-books all agree that nasal catarrh is not only contagious, but sometimes epidemic.

There may be some instances in which the disease appears to be infectious. The epidemic said to have occurred in St. Gall, Switzerland, in 1876, if the reports be authentic, would be an instance of this kind. In this epidemic the disease was said to be very severe, and investigation demonstrated the presence of numerous parasites (leptothrix, bacteria, &c.) in the secreted matter,

but no pus corpuscles. Schlenker, who studied these cases, concluded that the presence of the parasites was the cause of the inflammation of the root membrane. Some observers, among them being Dr. G. V. Black of Illinois, and Dr. Witzel of Germany, believe that the disease is caused by a certain species of fungus. We cannot deny the possibility of such a mode of origin, although I think no one has yet been able to demonstrate, by actual experiment, that there is any specific virus or contagium in this disease. I have endeavoured to transmit the disease by inoculation from the human subject to the dog, but so far have been unable to produce anything except a negative result. My method has been to make a slight incision between the gum and the prominent cuspid tooth of the dog, and inoculate with the fresh discharge carried on an instrument directly from the patient to the animal in the next room. It may be that the lower animals are not capable of developing the disease. It might be interesting and instructive to experiment in the mouth of a patient affected with this disease, by inoculating from the socket of an affected tooth to one not affected (by applying the discharge to a denuded surface), and observing the result. I have not as yet experimented in this manner to any great extent. Dr. Patterson states that there is the same tendency to destruction of periosteum and underlying bone in this disease as in nasal catarrh. I beg to differ with him in regard to the tendency to destruction of bone in pyorrhœa alveolaris. In nasal catarrh, when the bone is involved the process is one of caries, or necrosis, while in pyorrhœa alveolaris I think it is only very rarely that we have such a condition; but of this we shall speak further in treating of the pathology of the disease.

Whether or not there is always a constitutional predisposition in cases of this disease, is still a matter of much controversy. The preponderance of opinion seems to be that there is usually a constitutional predisposition. The traumatic or acute cases, without doubt, are due entirely to local causes, since almost any irritant of the kind described will induce the disease, and the removal of the cause results in a speedy cure. Cases in which salivary calculus irritates the pericementum and causes secondary sanguinary deposit might be classed as traumatic, for the exciting cause is a foreign body; but, although to a certain extent traumatic, they cannot be called acute cases, since the disease when induced by this cause generally assumes the chronic form. Perhaps this may

be accounted for by the fact that the salivary deposit increases very gradually, and the irritation is less on that account. I think that even in these cases of pyorrhœa from the irritation of salivary calculus, we must admit the presence of a constitutional predisposition (I refer now to typical cases, in which we have the deposit of sanguinary calculus and the formation of ulcerating and suppurating pockets); because we know that not all cases of salivary calculus, or of pericemental irritation, are followed by this disease. In fact, it results in comparatively few instances.

It is difficult to draw the line between local and constitutional origin in these cases, for if the exciting cause be salivary calculus, that in itself is often dependent upon constitutional derangement for its development. The cases in which we find no appreciable exciting cause are the ones less amenable to treatment.

To sum up, then, we regard the traumatic or acute cases as essentially local in their origin, since they are so easily induced and are so readily amenable to local treatment without showing any tendency to recurrence; but in the idiopathic or chronic cases, or those of pyorrhœa alveolaris proper, we think the causes are both predisposing and exciting, and that there is generally, at least, a constitutional predisposition rendering the disease liable to occur under local irritation, either mechanical or chemical. Salivary calculus, I think, is the most common exciting cause. The irritation of partial plates would probably come next in order of frequency. What the predisposing cause or causes may be, we are as yet not aware. Possibly the same, or a similar influence to that which causes exostosis of the cementum, may operate in determining the origin of this affection, the difference being, that in this disease the lime salts, instead of helping to form an organized tissue, are deposited in an amorphous manner. I think I have met with a greater number of cases affecting the teeth of the superior maxilla than of the inferior; but whether or not this has been the experience of other observers, I am not aware. The disease is one of adult life, and is common to both sexes. It is very rare in young persons, except when hereditary.

THE Annual Meeting of the British Dental Association was held in London, on the 19th, 20th, and 21st ult. Our report will appear in the next number of the DENTAL RECORD.

THE DENTAL RECORD.

VOL. VI.

OCTOBER 1, 1886.

No. 10.

CASE OF PYORRHŒA ALVEOLARIS, CHRONIC ALVEOLARIS AND NECROSIS OF OSSA NASI.

By CHAS. HOLMES, M.D., L.R.C.P., &c.

THE patient whose case is reported by Dr. Forshaw in the last issue of the DENTAL RECORD, and concerning which he asks for suggestions, seems to me to have been suffering from syphilitic œzena, due to syphilitic affection of the nasal bones. This would naturally, by extension or continuation of surface, extend to the pharynx, soft palate and fauces. The fœtor of the breath which was so marked a symptom and the length of time (14 years) which she had suffered from the nasal trouble, support my belief. Again, the removal of a piece of dead bone. Necrosis of nasal bones from any other cause is rare. Accumulation of tartar would follow as a natural consequence to disordered secretions and lowered vital power. The negative evidence elicited from the patient goes for nothing. Secondary eruption does not necessarily appear after contagion, and the length of time since the primary disease must have been contracted may well account for the patient having no knowledge of the existence of a rash which may have been very trifling if it did appear. The success of the anti-syphilitic treatment adopted by Dr. Rabagliati I consider satisfactory proof that the disease was of syphilitic origin, and that the calculus and pyorrhœa were secondary. To consider the pyorrhœa as the cause of the chronic pharyngitis would be to place effect where cause should be. The lachrymal duct having opened out under mercury and iodide of potassium is what one would expect. General practice brings many such instances under observation. The Eustachian tube thickened and narrowed, even to the extent of causing considerable deafness, can be rendered patent and its function restored by similar treatment, after resisting all other modes. The treatment adopted at the Eye and Ear Hospital in this case would no doubt be local, and if so would only, by causing irritation, increase the obstruction.

BRITISH DENTAL ASSOCIATION.
ANNUAL MEETING.

THE Sixth Annual General Meeting of the Association was held in London on August 19th, 20th and 21st. Over 230 members were present, and the meeting was a great success.

Sir JOHN TOMES, F.R.S., occupied the chair in the absence of Mr. Richard White, the President.

After the transaction of business, the CHAIRMAN said:—

It now becomes my duty to address you in the place of Mr. White. For should the President from any cause be unable to attend, it becomes the duty of the President of the Representative Board to take the chair at a general meeting of the Association.

The absence of Mr. White from continued indisposition will, I am sure, be a matter of deep regret to all of us, and the more so when we call to mind the active and important part he took in the conduct of our annual meeting held this time last year at Cambridge. On that occasion his mental energy and robust appearance gave promise of many coming years of health and vigour. Let us hope, then, that before another annual meeting comes round he will be restored to his former health and strength, and we may be sure that when his recovery is made good, he will be again in our midst, rendering as heretofore an ever ready and helpful hand in the promotion of all objects worthy of the attention of the Association, and in council advocating the cause of moderation, consistency and common sense. In the remarks I have to make upon the events of the past year, I will endeavour to take the position of your President, and bring to your notice such occurrences and give expression to such opinions, as he would if present approve.

The papers read at the last meeting have been published in our Transactions, and will speak for themselves, but attention may be called to a successful prosecution, in which the defendant rested his claim to exemption from the registration clause of the Dentists' Act on the ground that he held a foreign diploma, and that he was not an ordinary resident in the United Kingdom. This plea led to a definition of what in law constituted an ordinary residence. The counsel for the prosecution stated that the moment an unregistered person, whether a British subject or an alien, holds himself out to obtain patients in this country he becomes liable to conviction under the Dentists' Act. In other words, the act of

endeavouring to obtain patients carries with it the conditions of, and, indeed, constitutes, ordinary residence in the meaning of the Act. This definition was accepted by the opposing counsel and by the bench, and we may regard the conviction as determining the conditions which, in the eye of the law, constitutes ordinary residence, as mentioned in Section 4 of the Dentists' Act.

On a former occasion a prosecution was instituted in order to test the legal signification of the initial letters L.D.S. of Licentiate in Dental Surgery, and with the result that for a dentist to use them in connection with his name constituted an offence under the Act, unless at the time of use he did possess the qualification itself for which they are the recognised contraction or sign. In each case the proceedings were rather costly to the Association, but the determination of the exact legal signification of phrases of an Act is necessary to its rightful working, and the results we obtained are, from that point of view, quite worth their cost. Passing from legal proceedings necessary to administration, we come to a subject of great interest as regards the future working of the Act. I allude to the passing of the Medical Act, 1886, a section in which is devoted to the amendment of the Dentists' Act.

As a condition of the passing of the latter, certain clauses were introduced by the then Government, which in practice proved to be both costly and cumbersome, and went far to diminish the value, if not to some extent render useless, the penal sections of the Act. These, at the instance of this Association, have been removed. The Act requires that a private person, or any Association other than a Medical Authority, a Branch Council, or the Medical Council itself, shall obtain the consent of the Medical Council or one of its branches before entering on a prosecution.

Now, this need of assent proved a greater obstruction to the working of the Act than at first sight would seem probable. The Medical Council usually sits but once a year, and the branches very seldom. This of itself imposed great delay, amounting in some cases to little short of a year. Then the charge upon the diminishing dental fund was a matter of some consideration. Sixteen shillings and threepence is the cost per minute of the attention to dental, or indeed to any other, business of the Medical Council in session. So that if the assent of the Council to a prosecution occupies only five minutes, the dental fund will suffer to the extent of over four pounds. To this must be added the

cost of time occupied by the Executive Committee upon the question, and the cost of printing.

Section 26, paragraph 2, repeals the consent provision of Section 4 of the Dentists' Act, 1878, and says, "A prosecution for any such offence may be instituted by a private person," and in the definitions given in Section 27 of the Medical Act is the following: "The word 'person' includes a body of persons, corporate or not corporate."

Reference has been made to the determination in a court of justice of the signification of the letters L.D.S. when appended to a name. Further argument upon this question of signification is disposed of by the first paragraph of Section 26 of the Medical Act, 1886, in the following words: "It is hereby declared that the words 'title, addition, or description,' where used in the Dentists' Act, 1878, include any title, addition to a name, designation, or description, whether expressed in words or by letters, or partly in one way and partly in the other." This paragraph must be read as a continuation of paragraph 2 of Section 3 of the Dentists' Act, whereby the latter is rendered complete and, so far as can be seen, free from any legal obscurity. The prohibition of the use of dental qualifications, however expressed, by unregistered persons is rendered absolute, and it may, perhaps, be found in practice that the prohibition is more far-reaching than a casual reading of the amended clause would suggest.

Section 5 of the Dentists' Act says that "A person registered under this Act shall be entitled to practice dentistry or dental surgery in any part of Her Majesty's dominions." The power of the legislature, by an oversight in the drafting of the Act, has been therein exceeded, and an amendment rendered necessary. This is effected in paragraph 3 of Section 26 of the Medical Act, 1886, in the following words: "Notwithstanding anything in Section 5 of the Dentists' Act, 1878, the rights of any person registered under the Dentists' Act, 1878, to practise dentistry or dental surgery in any part of Her Majesty's dominions, other than the United Kingdom, shall be subject to any local law in force in that part." In other words, registration here does not entitle a person to practice in any of our colonies where a local law prohibits practice on the ground of an unrecognised British qualification.

The 4th paragraph of the 26th Section of the Medical Act,

1886, empowers the Privy Council to call into action the dormant 28th section of the Dentists' Act, 1878, the main purpose of which is the limitation of the number of dental licensing bodies. Upon this section we need not dwell.

It remains for me to notice only one other section, viz., 23 of the Medical Act, 1886. Hitherto we have had to summon the Medical Registrar on the occasion of a prosecution, to testify to the consent of the Medical Council to the prosecution, and as to any registration which has taken place in the interval of the annual publication of the register. For the future the attendance of the Registrar is made unnecessary by the following provision in Section 23:—"The following copies of any orders made in pursuance of the Medical Act, or this Act, or the Dentists' Act, shall be evidence; that is to say (1) any copy purporting to be printed by the Queen's printer, or by any other printer in pursuance of an authority given by the General Council. (2) Any copy of an order certified to be a true copy by the Registrar of the General Council, or by any other person appointed by the General Council, either in addition to or in exclusion of the Registrar, to certify to such orders."

And now we have come to the end of the list of amendments of our Act. They may seem to some of us but few in number, inadequate, and of small account. By those who have busied themselves in the administration of the Act, a widely different view will be held. To them it will appear that the Act has been greatly strengthened, and its powers rendered comparatively easy of application. But it must be constantly borne in mind that with increased power comes increased responsibility. If we have in the past been guarded in the use of the penal clauses, we must be still more guarded in the future. The sense of right, of fairness, of liberality, must in our counsels prevail over possible legal successes. The goadings of need, the despair of lost opportunities, the misdirection of ignorant and prejudiced advisers, must all be taken into account before proceedings are instituted.

We may well distrust our individual power of observing strict impartiality, and on this account it is very undesirable that a prosecution should be undertaken by one practitioner against another, although justice may be on his side; for personal dislike, envy, or a sense of personal wrong will most certainly warp the judgment, and lead us into error. In the only instance in which

a dental prosecution has failed, the proceeding was instituted by a private individual. The case was one which, had it been looked into by a public body, would not have been proceeded upon, and in which the magistrate considered the prosecutor to have been influenced by professional jealousy. It is the business of a judge to regard with suspicion prosecutions instituted by private persons of similar calling, and the possibility of the inspiring motive being professional jealousy will not escape his observation.

It has been said that the Act imposes upon the practitioner a costly education, general and professional, and that persons who have submitted to these conditions should be protected from the competition of those whose education has been less perfect and less costly. I should myself prefer to say that the Act protects parents and guardians from the temptation of imperfectly educating those of their dependants who select to follow our calling, by enforcing a fitting education in kind and degree, and that it protects young persons from the errors of a green and imperfect judgment, and above all from idleness, by enforcing the acquisition of a competent knowledge of their profession, thereby ensuring to them the incalculable blessing of power to rightfully fulfil the obligations they accept in treating those who receive their professional services. To me it seems that the practitioner who has been educated under the Dentists' Act owes to it a debt of the deepest gratitude, for its educational requirements have placed him in a position to practise with justifiable confidence, the offspring of knowledge and skill, and to surpass in usefulness those less perfectly instructed. Surely this of itself is a very ample reward for the cost and trouble of a systematic education and of registration.

Persons who with knowledge infringe the provision of the Act should undoubtedly be prosecuted, not so much for the protection of those who are protected by the Act in the superior education it has caused them to acquire, and by registration, but for the protection of the public, who are constantly imposed upon by false statements as to qualifications, knowledge and ability, and deceived by promises that cannot be redeemed by those who make them.

The considerations I have endeavoured to set forth, if correct, will, I think, fully justify my opinion that a prosecution under the Act should not, unless the attendant circumstances are very ex-

ceptional, be instituted by a private person. I put forward this opinion on behalf of the profession at large, the credit of which would be greatly injured in public esteem by the frequent spectacle of one practitioner prosecuting another. Such proceedings would, in most cases, be set down as undertaken, not in the public interest, but for the furtherance of private aims and ends, and in this regard the injury to the profession would be as nothing when compared with the mischief which would be liable to fall upon the private prosecutor, whose motive became the subject of unfavourable allegations.

The powers of the Act, to my judgment, if properly administered, are ample and sufficient for educational purposes, and for the regulation of the profession, and it is the business of this Association to aid by all legitimate means the efforts of other authoritative bodies in rendering effective such administration. In no case will its efforts be more useful than in presiding over the application of the penal sections relating to the unregistered.

Mr. White, whose place I am endeavouring to fill, in his inaugural address of kindly regard for the success of our younger brethren, brought to our notice the difficulties that beset their path at the outset of practice. The president of our Southern Branch, Mr. Alderman Rymer, takes up the same theme, and, admitting the difficulties detailed by Mr. White, offers well-grounded encouragement to those who are entering upon their professional career. But there are difficulties lying nearer home than those referred to by our two distinguished Presidents. I may perhaps be allowed to take a page out of my own professional course of life, in illustration of an early and common stumbling-block to success.

A physician of great eminence, and a sincere friend, said to me on my commencing practice: "I shall not send you any patients for some time to come, for if I did you would not keep them; they would leave you with an unfavourable impression on their minds, and your future success might be retarded by my injudicious efforts to render you early service. You have yet to supplement, and to some extent unlearn, your hospital methods and manners; you have hitherto been engaged in treating cases, and have paid little or no regard to the personality of the patient. If you would succeed in private practice you must devote your attention not only to the case but to the personality of your patients; you must

consider with attentive kindness their feelings, prejudices and statements, exaggerated and whimsical though they may be, not in prejudice, but as a help to the successful treatment of their cases. You must make an effort to place yourself in real, not pretended, sympathy with their feelings and wishes ; then, armed with superior knowledge and skill, you will be in a position to render them great service, for which they will in return be not only grateful, but will remain your friends." I did my best to merit confidence, and my friend kept his word ; patients he sent to me sought, as occasion required, my aid throughout the whole of my professional career—they and their children, and, in some cases, their grandchildren.

I am not advocating the exhibition of a false and pretentious manner, but the sincere cultivation of kindly, sympathetic feeling towards those who become patients. Feelings which, if possessed, will show themselves unconsciously in a thousand ways, in concordance with the character of the possessor. If the advice given by Mr. White and Mr. Rymer, with the counsel given to me, and which I am endeavouring to transmit, be truly followed by the young practitioner, he will soon be able to disregard the reputed success of the public advertiser, whose ill-earned gains, if counted by their cost, need not be a subject of envy. In my experience, the true cause of want of professional success, if rightly sought, will, in the majority of cases, be found to lie not at the door of the public, but within the threshold of the practitioner. It will be found that he has failed to appreciate and acquire that true professional feeling which Mr. Turner has so well described in his admirable address to the Students of the Dental Hospital of London on distributing the prizes, and which is published in the August number of our Journal.

So far as can be foreseen, the passing of the Medical Act, 1886, has brought to a close, for a generation to come, legislation on dental matters. It now remains for practitioners to develop, under the existing laws, dental knowledge and skill to the highest attainable degree, and in bearing the burden thus imposed I can no longer take an active part.

Speaking for myself certainly, and perhaps for those of like age to myself, I think I may venture to say that in the near future our duty lies in giving encouragement and counsel to those who are in the midst of life and personal activity, leaving to them the field of

original research and of systematic teaching, for the cultivation of which we are no longer fitted, but which in times now passed offered to us inspiring hope and active enjoyment. Each term of life has its allotted duties, and it is well for ourselves and those with whom we are associated when we recognise and rightly discharge them. We should assist, we may not hinder, the development of our useful calling.

Let me thank you for the patience with which you have listened to my somewhat long, and I fear uninteresting, though I hope not altogether useless, address.

It now becomes my duty to vacate the post which Mr. White, had he been here, would have filled. But before I do so I must ask you to pass a vote of sympathy and of thanks to your absent President.

The vote was carried by acclamation.

Mr. UNDERWOOD, in proposing a vote of thanks, said: You have heard the very interesting and elaborate address of the President of the Representative Board, in which he has shown you what great things were achieved by the Act of 1878, and the advantages that have accrued to our profession by the amended Medical Act of 1886; but you have not heard from his lips how great a share of the labours that have so happily been crowned by success have fallen to his lot. I may say that his life has been spent in the interests of the profession: that is far and widely known; but you cannot all be aware, as those are who have worked more closely and intimately with him, what an expenditure of mental exertion and valuable time, and what an absolute forgetfulness of self have distinguished him throughout his long endeavours to bring about the present happy state of affairs. I am sure you will all recognise the debt you owe him. He has had many things to cheer him in his life; let us make, if possible, his cup of happiness overflow to-day, by giving him a most hearty vote of thanks for all he has done for us.

The proposal was carried by loud and prolonged applause.

Sir EDWIN SAUNDERS then took the chair as President, and delivered the following

INAUGURAL ADDRESS.

Gentlemen, Members of the British Dental Association:—I desire, in the first place, to express my thanks for the honour you have done me in electing me your President on this interesting and remarkable occasion, on which, from the uttermost parts of

the earth, her children have flocked to this little northern island to pay their homage and to attest their loyalty to our Empress-Queen. And although there cannot but be a shade of sadness over our proceedings, occasioned by the lamented absence of my predecessor, Mr. White, through serious and protracted illness, yet our, and his, consolation will be that his place has been so ably filled by our esteemed friend, Sir John Tomes, whose improved health, we are glad to know, has enabled him to volunteer a ready response to the demands on his time and attention which have thus unexpectedly arisen.

One of the earliest and not the least arduous of the duties with which the new President is confronted is the delivery of an appropriate address, which, without being irrelevant, should not be devoted too exclusively to a consideration of the constitution and functions of the Association, and thus become a mere echo of addresses delivered on former similar occasions. On the other hand, it should not be alien to the pursuits and interests of the assembled members of the Association. With these feelings I desire to propitiate your indulgence in the few words I am about to address to you, if they differ, as they may do in some respects, from what is customary, and from what you may be justly entitled to expect; and in order to effect this propitiation, it is only right that you should be made aware of the reasons which seem to justify this departure from established usage. Two considerations especially conspired to render this innovation imperative. First, the Association having now entered on its second lustrum, the story of its birth and development, its constitution and functions, has necessarily been so often the theme of my predecessors in this chair, and has been treated in so able and exhaustive a manner, that it would now be tedious as a twice-told tale; and, secondly, having observed at the last very successful and interesting meeting at Cambridge, that ladies were found to grace our proceedings with their animating and approving presence, without exhibiting (whatever they may have felt) symptoms of weariness, it seemed to me that it behoves us at least to endeavour to avoid being tedious, and to seek to escape for a time out of the narrow and strictly professional groove. In what I shall have to say, therefore, it will be my aim to take a somewhat broader view of the social changes that have happened since the institutions connected with our speciality came into existence, though without losing sight of their

more immediate application to dental surgery ; and I am further emboldened to make this innovation upon established custom by the favour with which the attempt to add an extra-professional department of art products, with a charitable object, was received at our last meeting. Thus it will not be necessary to dilate at any length on the advantages of an Association such as that to which it is our privilege to belong ; in the kindling of friendships among members of the same profession, where in its absence there might be groundless jealousies and misapprehensions, which disappear on a better and truer acquaintance with each other ; in the opportunity thus afforded of the diffusion of technical knowledge, and of imparting many a valuable hint in practice, or of fertile suggestion in treatment, containing, it may be, the germ of some great improvement, but which might otherwise be consigned to the limbo of unfructified thought ; in fostering a feeling of brotherhood, and of generous and unstinting appreciation of what is good in others ; of a chivalrous *esprit de corps*, which would render anything mean or of the nature of detraction simply impossible ; of enforcing that higher ethical standard, in short, which makes each individual feel that the honour of the profession to which he belongs is for the moment in his charge, in a sense, and to an extent unintelligible where no such organization exists. Nor need we do more than glance at the not unimportant uses of such Associations, in protecting alike the public and the profession from the incursions of the unworthy and rapacious—the hirelings, not true shepherds—who, not being qualified to enter by the door of certificated competency, have contrived to climb over some other way ; in providing a Journal as a means of communication between members of the profession in this country and throughout the world, thus introducing novel plans of treatment, or modifications of known processes or remedies, and so of determining their value and assigning them their true place, by subjecting them to the test of collective investigation ; or, finally, by arranging these very agreeable annual meetings, at which, as at some intellectual tournament, the thinkers and workers of the profession who are not content to do simply what has been done, come into the arena, throw down the gauntlet, and challenge all comers in defence of their supposed new fact in biology, their new method of treatment, or their new theory of disease. Nor shall I occupy your time in pointing out the social aims of association as inducements

to human intercourse, and the concomitant and incalculable blessings which flow from the friendship and the encouraging sympathy of our fellow men. For if there should still be any members of the profession who, after the report of the brilliant receptions at Plymouth, at Edinburgh, and at Cambridge, still hold aloof and decline to join the Association, I am quite sure they would not be amenable to any arguments that I could adduce, or any eloquence that I could command.

With this prefatory explanation, I may now address this audience in more courteous and correct fashion, as:—Ladies and Gentlemen: If we were suddenly called upon to designate the chief characteristic of the age in which we live, to express by a phrase or by a single word the great need of our common humanity at the present time—a need of which we are all more or less conscious, for the most part with a dim and dumb consciousness, but in regard to which aspirations are never wholly absent—we should, I think, exclaim with the dying Goethe, “Light, more light”; light physical and light intellectual. And it is not a little remarkable that this need in both kinds should have simultaneously found satisfaction; that the various and brilliant applications of electricity in aid of both sight and sound, the capturing and subjugating to our use and service the blinding and devastating lightning’s flash, should synchronise with an unparalleled development of scientific research and with the multiplication and improvement of the means of wide diffusion of such results. The multiform and marvellous applications of this most subtle and fugitive of elements must be regarded as among the grandest achievements of our time. Giving, under normal conditions and in a state of equilibrium, no evidence of its existence, and yet pervading all forms of matter, whether solid or gaseous, and under certain conditions profoundly affecting the state of the atmosphere by which we are surrounded, not seldom suddenly dealing death and destruction to animal and vegetable organisms, and ruin to the noblest monuments of human genius, it can yet be subordinated to the use and convenience of man. We are all familiar with the startling and instantaneous revelation to the eye, of minute objects, under a momentary flash of lightning, which would be unobserved in ordinary daylight, and with the vividness and truth with which all tints and shades of colour are reproduced. When to these two qualities the searching and pervading character of the

light, and its absolute colourlessness, by which natural colours remain unchanged and unvitiated under its influence, another most valuable quality is added, that of its not requiring oxygen for its sustentation (in which it is most favourably distinguished from all other forms of artificial illumination), it will at once be seen how valuable an addition has been made to the forces of nature which have been brought under man's control. For with all other forms of light, as the result of combustion there must necessarily be contamination of the atmosphere, more or less disastrous to health and respiration, arising both from consumption of the oxygen in the air and from noxious products of the processes of producing illumination. It was a happy thought, therefore, and a great step in science, to seize the perfect light in the flash of lightning, to rob it of its terrors, and to subjugate it to human control, to make it subservient to human convenience. It was another and by no means the least important of those applications of scientific discovery to the needs of daily life of which this latter half of the nineteenth century has furnished so many and striking examples. But the idea was of slow birth and evolution. The unknown is always full of terrors, and superstitions die hard; and it was not till long after science had elucidated the true nature and origin of those atmospheric convulsions, which an exaggerated idea of the Divine superintendence of mundane affairs attributed to a manifestation of the anger and vengeance of the Almighty for the nation's sins and short-comings, it was not till long after this idea was exploded, that it occurred to anyone to endeavour to render this wild and apparently untameable force amenable to human service and convenience. Nor is it a mere figure of speech to speak of the electric spark and the lightning flash as identical in origin and nature; for, as we all know, they are both due to the energy with which electricity seeks a return to equilibrium or a state of rest. That when, for example, two masses of cloud approach each other, which under ordinary conditions would contain 100 parts of electricity, no effect would be produced; but if, from whatever cause, one of these clouds should hold only 50 parts and the other 150 parts, being 50 parts in excess of the normal amount, the energy with which restitution would be made, when they come within what is called striking distance, and with a dry atmosphere, would give rise to the convulsion of the nature known as a thunderstorm. And we all know that such convulsion of nature may be avoided by, if practicable,

making a metallic communication between these masses of cloud, or between the cloud and the earth, by which the transference of this excess of electric force is facilitated, as is seen in the ordinary lightning-conductor, and thus the normal state is restored without the development of heat and light. If, however, the metallic rod or wire is insufficient to carry the amount of electricity, it will be burnt up in the process. By observing these conditions, storing up electricity in excess by batteries, or better still, by dynamo machines, actuated by steam or gas; by providing iron or copper wires of sufficient conducting power to convey away this surplus electric force, and so again to establish the normal condition or equilibrium; and by making breaks in this conducting wire and inserting in such breaks a thin thread of platinum, or other indestructible matter, which becomes incandescent by reason of its insufficient calibre and conducting power, a light of unequalled purity and intensity is obtained; a light which is constantly spoken of as, and doubtless is destined to be, the light of the future, but which at present, and probably for some time to come, from the cumbrous and costly process by which the electricity is obtained and accumulated, will have to be reckoned among the luxuries of social life. Meanwhile, its numerous advantages over other illuminants, as regards human health and comfort, are made evident by its use in theatres, halls, churches, and places of public resort. And it is no matter for surprise that the intellectual activity which is so characteristic of the present time, especially with regard to medical science, should have seized upon so valuable an ally in treatment or diagnosis. Accordingly, various novel and ingenious adaptations have from time to time been given to the profession, for throwing light into the cavities and dark corners of our organisation, by which the nature and site of lesions have been discriminated with more accuracy than was possible without such aid, and by which also operations could be performed and topical remedies applied with a nicety which had been hitherto unattainable. Such are the laryngoscope, in the treatment of throat disease, with adaptations for the ear and nose; and the lamps (of which some of the best, by Messrs. Ash and others, may be seen at the Dental Hospital), for illuminating the oral cavity. Of the other known uses of this youngest and fairest of Nature's forces—its therapeutic value in treatment of neuroses and of paralysis; as an unerring and swift messenger for the conveyance of our

wishes or our most tender thoughts, nay, even the cherished tone of voice to distant parts, and probably at no very remote date as a means of transporting ourselves with safety and celerity—we may not now speak, for time passes, and if I would keep my promise not to be tedious, must touch but lightly, and only on the outer edge and fringe, as it were, of that other great and entrancing subject, light intellectual.

It is always difficult, not seldom impossible, to fix the date of a new departure or of an original discovery; for whenever it bursts upon the world some one will be found ready to point out that the present promulgator was anticipated by some investigator of a former age, or that some faint adumbration of the supposed new idea may be detected in some long-forgotten archives. But we should not probably be far wrong in assigning to the first great International Exhibition of 1851 the occasion of which the first beams of that quickening and illuminating effulgence began to exercise an influence on the social life of this country. That great event would seem to have furnished the initial impulse towards progress which has continued to the present time, and has made itself felt in every department of the national life. Parliamentary representation has undergone modifications with the view of bringing it more into harmony with the growing intelligence of the people; the National Church has had infused into it a more sympathetic spirit both in its architecture and ceremonial; legal proceedings have been simplified; the army has been remodelled; the wooden walls of old England have been replaced by turret ships and iron-clads, and the traditional British sailor has given place to the skilled engineer. In no department of the national polity is the spirit of progress more evident than in that which concerns itself with education, and much indeed has been accomplished in this direction with the view of satisfying the popular cry for more light. Not to speak of Board Schools and State education and the social revolution to which it is giving rise, or of the incursions into man's sphere of work by an epicene section of the fairer half of mankind, who are no longer satisfied with the empire of the home and of the heart, our whole educational system has been fundamentally modified and re-arranged. Science has at length conquered for itself a place and recognition in our seats of learning, and now divides the throne with literature and classic lore. All kinds of knowledge are made more accessible by

improved methods of teaching, by the indefinite multiplication of popular lectures, or by handbooks and journals of an ever-teeming press, investing lines of study which had come to be regarded as rugged and arduous with a charm and an interest which they had hitherto not been supposed to possess, and which give a new emphasis to the poet's words:—

How charming is divine philosophy,
Not harsh and crabbed as dull fools suppose,
But musical as is Apollo's lute,
And a perpetual feast of nectar'd sweets.

Nor has the change been less marked in matters medical. Sanitary science has arisen, and people have learned much concerning the laws of Nature, and how to manage their own health. More intelligent care is given to diet, less reliance placed in drugs, the teachings of modern medicine being directed rather to the promotion of health than the cure of disease. Nor should we forget that last best gift to suffering humanity—that crowning glory of the Victorian era—the abolition of pain by anæsthetics, by which the sum of human misery has been indefinitely lightened under operations by which life is prolonged, or again made glad, which would otherwise have been impossible.

And if surgery can point to its triumphs, in a greatly diminished mortality from severe operations, whether due to increased care in the antiseptic after-treatment, or to the avoidance of shock to the system by the resort to anæsthesia, medicine can also boast of the additions to its armamentarium of numerous valuable aids to diagnosis. Such are the stethoscope in lung disease or affections of the heart; the sphygmograph, which not only records with unerring accuracy the frequency but the peculiar form and rhythm of pulse-beat; the laryngoscope for throat disease; and various chemical tests and instruments for determining the temperature. I say nothing here of germ theories of disease, or of treatment of prophylaxis by inoculation, as being a subject still to a certain extent *sub judice*; what is of greater interest to us is, that this same wave of intellectual light has not been without its influence on our own speciality. Whether we direct our attention to the facilities afforded by the schools in connection with the dental hospitals, or to the improved construction and preparation of instruments, materials, and appliances, we cannot fail to be struck with the progress which has taken place, and it

will always redound to the credit of our specialty that it was privileged to give to a grateful world the inestimable boon of anæsthesia.

The dominant idea of the organisers of that Exhibition, and of that wise philanthropist, the late Prince Consort, under whose fostering care it prospered, was to popularise art. Not so much to encourage the production of what is rare and costly (though this was not neglected), as to bring artistic treatment into matters of daily life. A conscious desire for emancipation from the monotonous and sombre uniformity of the routine of daily life began to manifest itself among the people of this country, and it then occurred to that sagacious prince—always mindful of the precept, ‘not to look on our own, but also on the things of others’—that apostle of altruism of the best kind—to invite all the nations of the earth to bring their best products and possessions to our midst, for mutual advantage, comparison and improvement. How this was responded to, and with what far-reaching and stupendous results,—in the purifying and elevation of taste in our pottery, china, and metal work, in our furniture and the decoration of our dwellings, in our domestic architecture and all the details of daily life; what an impulse was given to progress of every kind; what rays of intellectual light were thus opened out, of light which can never be quenched,—is now matter of history. But it was not only, or even chiefly, as a revelation of beauty under our dull skies; it was not only as a collocation of the art marvels of sculpture and painting from Rome and Florence; of the beautiful and expressive wood carving, the ornate metal work, and the tuneful chimes of Belgium; the tapestries and china, the perfect drawing, the exquisite colouring, and the thousand elegancies of France; the erudition, the culture, and the more severe forms of art of Germany, that it possessed an interest of its own for us, but rather for its teaching power. Not only was the eye regaled with results, but the processes by which those results were obtained were shown and explained. A death-blow was thus dealt to the old exclusive system by which the arcana of any trade or craft were jealously guarded from the neophyte. Handicrafts had indeed been for the most part described as “mysteries,” and it was only after long and hard service as apprentices that the pupils were permitted to snatch furtive glimpses into the penetralia of the craft. And in our own profession not only did this system prevail amongst the apothecaries, but

even within living memory in the highest ranks of the profession. It was no uncommon thing for a large premium to be paid to a leading consulting surgeon, with the implied expectation of the reversion of a hospital appointment. Such a scandalous state of things, with the nepotism to which it gave rise, and the consequent discouragement to the diligent student, is happily now no longer known. And here I cannot help pausing for a moment to contrast the state of things in our own specialty as I and my contemporaries found it, with that which is presented this day to those who have had the wisdom to avail themselves of the opportunities afforded them by becoming members of this Association. At the time to which I refer, the only hospitals which recognised our speciality, so far as to institute a department of dental surgery, were Guy's, presided over by Mr. Thomas Bell, well known as a professor of natural history, as well as a distinguished member of the profession, and St. Thomas's, of which I was the first incumbent. At each institution a short and somewhat elementary course of lectures was given, our experience being that the majority of the class being about to embark in general practice, they were not disposed to devote much time to more detailed instruction. This, with attendance on one morning in each week for operative practice, consisting almost solely of extractions, with an inconvenient chair, a bad light and worse instruments, in an out-of-the-way corner of the out-patient's department, constituted almost the only means of acquiring the requisite skill and knowledge for the practice of dental surgery. It is true that the system of apprenticeship before alluded to was in force, but the time devoted to becoming qualified by this means consisted for the most part of mechanical drudgery in the construction of artificial arrangements, with but rare and scant opportunities of operating, or of witnessing operations on the living subject. So great was the difficulty, indeed, of getting to know the method of work of an eminent member of the profession, that men were fain to make themselves patients, and thus obtain a surreptitious and necessarily imperfect knowledge. What a contrast does this state of things present with that which now awaits the members of this Association. Instead of only two hospitals with a department of dental surgery, no general hospital would now be regarded as properly equipped which proposed to omit that important and necessary specialty. This is, so far, a matter of congratulation, as an evidence of the estimation in

which our art is held by the public, and by those who have the control of such institutions, and also as ensuring more skilful and humane treatment for those among the out-patients who are afflicted with dental troubles ; but as a means of affording opportunities of education for those who propose to devote themselves to the practice of the specialty in its present advanced state, the most perfectly arranged department in a large general hospital must necessarily be wholly inadequate. The necessary quietness and patience, the delicacy of touch, the complexity of the processes, the finish and cleanliness of the instruments, the absence of means of draining off and diverting the deluge of saliva, fatal to the success of many dental operations, the want of good light, and other disadvantages which will readily suggest themselves to those who have had experience in this matter, unequivocally point to the necessity of a separate hospital and a special school for teaching purposes. How well this want has been provided for in the two dental hospitals in this metropolis, with their respective schools and professors, is attested by the number of students who annually flock to their portals for the instruction which they are so well fitted to afford. At that noble institution in Leicester Square, which has been provided and dedicated alike to the sacred cause of humanity and of education, where the highest skill and the most humane treatment are brought within the reach of the humblest and most indigent, the diligent and anxious student is invited to witness the most advanced methods of practice by distinguished operators. With a light such as is rarely to be found in London, and which is indeed all that could be desired, with a chair admirably adapted for the purpose of supporting the patient in a favourable position with a minimum of fatigue, and which has the further merit of combining simplicity with economy ; with all the latest improvements in instruments, materials, and appliances ; with the most dexterous methods of work demonstrated by hands of acknowledged skill, we have a combination of favourable conditions for the acquisition of knowledge formerly undreamed of, and as to which it is not too much to say that it leaves nothing to be desired. And this contrast is, furthermore, of a satisfactory nature, as showing that our specialty has kept pace with the spirit of the time, in throwing down the barriers of exclusiveness, which formerly hindered its progress and threatened to deprive it of its claim to be regarded as a liberal profession. Nor is it too much

to assert that this broad and enlightened spirit of progress, which has culminated in the formation of this Association, may have received its initial impulse in that new departure of 1851 which has undeniably left its mark over the whole wide domain of science and of art.

A vote of thanks having been awarded to Sir Edwin Saunders for his address,

Mr. MORTON SMALE, M.R.C.S., L.D.S., L.S.A., Dean of the Dental Hospital of London, read a paper on

DENTAL EDUCATION.

The dental education of our sons and pupils is a subject fraught with so much interest, and of such vital importance to us all, that a short practical paper, dealing with its various details appeared to be of probable value at our gathering to-day.

We are each in turn asked by relatives, friends, or pupils, how the dental tyro is to proceed? It is to prepare us with a ready answer to such questions that I venture to address you. The importance of the subject is my excuse for troubling you, and may, I hope, prove an equally powerful reason for you to be lenient in your criticism.

The objects of education as applied to dentistry are, I take it : Firstly, to provide that those who practise our profession shall be gentlemen. Secondly, to enable these gentlemen to place their names on the Dentists' Register, in order that they may practise it ; and thirdly, that those who practise it shall do so with benefit to their patients and credit to themselves.

There are failures in all these directions. *A gentleman* may fail to become a dentist, even all those who do practise it are not gentlemen, while some practise it without either benefit to their patients or credit to themselves. So much is this the case, that there are those following our vocation who are ashamed of their profession, who can only speak "evil of the bridge that carries them over," because, forsooth, there are black sheep upon the Register who take every opportunity to degrade their own calling. One might with equal justice be ashamed of our humanity, because there are members of it who habitually disgrace it ; the best of mankind, however, "walk *not* upon the other side," but endeavour, by good example and providing education, to raise the renegades to a higher standard of nobility and self-respect. Such it appears to me is the line of conduct adopted by this Association, consequently

it has attracted to itself the best and truest members of our profession; conspicuous among these, we must allow, are the two gentlemen our Sovereign has been pleased to honour with knighthood.

The requirements of the necessary curriculum to get upon the Dentists' Register vary according to the country in which the examination is passed. It is my intention to deal only with the requirements of the College of Surgeons of England, that being the one most frequently taken, and generally admitted to be the most thorough.

The curriculum may be divided into—

- a.* Preliminary education.
- b.* Professional education.
- c.* Examination.

The regulations with regard to "the Preliminary" are to be obtained at the General Medical Council Office, 299, Oxford Street, several copies of which are upon the table. From these it will be seen how numerous are the opportunities for our youths to pass the necessary standard. I can hardly speak about them all, but of the more important I will say a few words, viz., the Matriculation of the University of London, the Oxford and Cambridge Local Examinations, and the Special Examination conducted by the College of Preceptors for Medical Students.

The matriculation, which is held in January and June, is on all grounds the best of these; it should be passed when a youth is sixteen or seventeen without much difficulty. It possesses these advantages:—It ensures the boy receiving a fairly good education, it opens the doors to all the professions, and if at any time during his pupilage or hospital career, the student should forsake dentistry for any other branch of the healing art, it is open to him to do so, without returning to school books and passing another preliminary examination.

Much might be said here, did time permit, about the education of boys; but I will content myself with saying that I consider the requirements of the University of London the most perfect. It does not over-rate the classical, the modern, or scientific side, but has struck out for itself an independent and useful line of education. The embryonic student failing this should "negotiate" either of the local examinations of the older universities, and failing these, the one conducted by the College of Preceptors,

the order in which these are placed showing their relative values.

This comparatively recent addition of a preliminary examination to the dental curriculum is of great importance. It provides that as the students will be members of a learned profession, they should be fitted to adorn their calling in life and the society in which they will be called to move. It is the foundation, moreover on which the whole superstructure of their professional education is to be built ; it is therefore impossible to exaggerate its importance or to make it too thorough. Let me beg of you not to advise our youth to pass the examination which is easiest : our common frailty prompts us enough in that direction ; but we all should encourage them to pass such a preliminary examination, that in their future they can contemplate it with pride and satisfaction.

The necessary preliminary having been passed, the purely professional part of the education commences by an apprenticeship to a registered dentist, in order that the mechanical side of our calling may be thoroughly mastered ; the College of Surgeons of England requires this to extend over three years. Immediately the articles are signed the youth should register as a dental student.

No professional work is recognised by the College of Surgeons prior to registration. It is important to note this. Many heart-burnings and much trouble to officials would be saved if this simple regulation was thoroughly grasped, viz., first, preliminary examination, to be followed by apprenticeship and registration simultaneously.

It is impossible to over-rate this mechanical training, and three years is not a day too long to spend in a workshop to learn and master the many minutiae of the mechanical art, without a thorough familiarity with which it is impossible to be a good dentist. I hope the day is far distant when this pupilage will be abolished.

In another country it is the custom, I believe, for the mechanical training to be given at the dental school. We in England should be sorry to see this plan adopted, for we find enough to do at our schools to teach the operative part of our profession ; moreover, the mechanical part cannot be taught in classes as thoroughly or well as under the personal supervision of a skilled mechanician.

There is one more danger we must avoid, the separation of our profession into two parts—operative, mechanical—this would be a

fatal mistake. The successful dental mechanic is he who has a thorough practical knowledge of the anatomy of the oral cavity and its surroundings, and who is deft and clever in his digital manipulation. The successful operator is he who, in addition, has a thorough practical knowledge of the laws that govern mechanical matters. The first-rate dentist is he who combines both qualities in an unusual degree.

At the expiration of three years the hospital career should commence by simultaneous entrance at a dental and general hospital. The candidate should now register as a medical student, not necessarily to take a medical or surgical qualification, but lest at some future time he should wish to do so; the work which would be done at the general hospital for the dental qualification, and is largely the same as that required for the general qualification, need not be repeated, but the whole of the time so spent should be allowed to count as part of the medical curriculum.

This hospital work is the most serious in a student's career; he is launched into London life mostly without any influence over him, save that of his early training at home and in the workshop; in proportion as they have been thorough and earnest, as a rule is his time spent during his student days. These hospital years should be spent in real hard work in mastering every detail of the operative department. The students should seek advice from their teachers, and avail themselves of every opportunity of learning from the large experience of the members of the hospital staff, in order that each generation may progress nearer to perfection. At the general hospital let the time be spent mainly in the dissecting-room, the physiological laboratory, and the out-patient department, in which places the most practical part of the medical education is obtained. The out-patient room is not sufficiently often visited by the general student, and the attendance of the purely dental student is, I fear, nearly nil.

This brings me to examinations—class examinations and the examination for the license in dental surgery. Of the former I should like to say to the student, never miss an opportunity of attending these; if they consist of *vivâ voce* questions only, they are useful; but if, in addition, there is a paper to be written, they are most valuable to teach men to write papers and prepare them for the ordeal at the College of Surgeons. This latter is really very thorough, but I should like to see added to it an examination

in the mechanical department ; if, as I maintain, the two departments are to constitute the whole profession, and a board of examiners is to decide who is fitted to practise it, each side of the profession should be made a subject of examination.

Dental *materia medica* might with advantage be a subject of examination, and replace in the curriculum the ordinary course of *materia medica* ; this latter has virtually been removed from the double qualification schedules, and relegated to pre-hospital days.

There is yet another question of interest to us, viz., the desirability of maintaining and cementing the union between the dental and other branches of the healing art. I think we are all agreed upon this. Nothing will so strengthen this bond as members of our department taking, in addition to the license in dental surgery, the so-called double qualification ; it will place the dentist on the same platform as the mass of the medical profession, and it would be the most practical way of showing our desire that such an end should be consummated. I should indeed be sorry to see the dental regarded as a distinct profession—already it is too much considered so by the general public. I cannot too strongly advise those who have to train young men to persuade them to take the double qualification of the conjoint Colleges of Surgeons and Physicians. Should this mode of procedure be adopted, I venture to predict that the progress of our vocation in the future will be more rapid and thorough in its nature than it has ever been during the last thirty years. This advance will be of such a character that dentistry will take its place as an essential part of the great medical profession, the other branches of which will be pleased to acknowledge the dentist as a brother pledged with them to the relief of human pain and suffering.

Increased medical and surgical knowledge is of great value, and enables us to take a larger and broader view of matters concerning oral surgery. He who spends four years instead of two at a general hospital must have this extra knowledge.

The following incident points out my meaning. A lady about forty consulted a London dentist with regard to her teeth. During one of his operations, he noticed a small papilla on the side of her tongue. He inquired about this, and found it had existed for several months. The tongue was examined carefully, the glands in the neighbourhood were not infiltrated, but there was slight cachexia and loss of weight. She was advised to have the papilla

and some surrounding tissue removed, and for this purpose to consult an eminent surgeon. This was not done, and within two years she died of cancer of the tongue. Had the operation been performed at the time it was advised, very probably this lady might have lived for many years. This demonstrates in a practical way the usefulness of the larger knowledge.

It is urged, on the other hand, that the course I recommend takes too much time and money. I can only ask what they weigh in the balance against knowledge and power? Moreover, neither the time nor the money are wasted; but may be regarded as invested capital that will return an adequate interest. It is possible also for the student to meet this extra expenditure by taking *locum tenens* during the vacation.

Yet again it is urged, that he who devotes all his time to dentistry pure and simple must be the best operator. This is not borne out by experience; our best men almost invariably are those seeking the higher qualifications.

After a student has been at the hospital some time, he often evinces a desire for another qualification, and is not satisfied with the "L.D.S. only" as he calls it, and wishes to seek in another hemisphere the high-sounding title of "Dr." This appears to me to be a slight on our country. Our schools and English dentistry, all of which, I maintain, are the finest the world produces, and he who boasts the M.R.C.S., the L.R.C.P. and L.D.S., obtained by study in our best English schools, can hold his own against the world, and if recent agitation in the medical profession ends successfully, he will be given the title of M.D.

Mr. Hutchinson, when he found we were to deal with kindred subjects, asked me to handle also the subject announced in his name. I will therefore endeavour to point out how it is best for the dental student to obtain these three qualifications.

After the preliminary examination has been passed, the student should register as both a dental and medical student; during the mechanical apprenticeship receive instruction from any registered medical practitioner, or from any pharmaceutical chemist, or at a public hospital, or infirmary, or dispensary, in chemistry, including chemical physics, practical chemistry, pharmacy and materia medica, and present himself for examination in these before entering a hospital; or, if he prefers it, he may take the two latter later in his career, viz., at the second examination. At the

expiration of his first winter let him pass in elementary anatomy and physiology; at the end of his second winter let him take anatomy and physiology.

At the expiration of two years he may present himself for the dental license; he will during these two years have been attending simultaneously both the general and dental hospital. During the remainder of his time he should devote himself to surgery, medicine, and midwifery, &c., in which subjects he may be examined at the expiration of two years from the time of passing the second examination.

It was felt that the recent changes brought about by the amalgamation of the two Colleges have greatly increased the difficulty of obtaining these higher qualifications; I must ask you to take my word for it that such is not really the case; the curriculum is really simplified, and a candidate now is only re-examined in the subject in which he fails. The old M.R.C.S. only, as a separate diploma, is a thing of the past; it is only advisable to deal with things as they are. I may be asked what is the extra time and money required to take these extra qualifications? It takes two more years, but the whole of these need not be necessarily spent in London. One winter and two summer sessions may be passed in one of the following ways:

- (a) Attending the practice of a hospital, infirmary, or other institution recognised as affording satisfactory opportunities for professional study;
- (b) Receiving instruction as a pupil of a legally qualified practitioner holding such a public appointment, or having such opportunities of imparting a practical knowledge of medicine, surgery, or midwifery, as shall be satisfactory to the two colleges;
- (c) Attending lectures on one or more of the required subjects of professional study at a recognised place of instruction.

The twenty cases of labour can be signed for by any legally qualified practitioner.

The duties of clinical clerk and surgical dresser, which must be discharged after the second examination during six months each, can be performed at a general hospital, infirmary or dispensary, or parochial or union infirmary, recognised for this purpose.

These arrangements make it less costly for students whose parents live in large towns where such public institutions are

found, a large proportion of the expenditure being living in town.

The actual increased expenditure in hospital fees is about fifty or sixty guineas. The examination fees for the three examinations for the double qualification under the conjoint scheme is thirty-five guineas.

For the convenience of reference I should like to tabulate as concisely as possible the best mode of procedure for the dental student to obtain the three examinations :—

1. Preliminary examination.
2. Apprenticeship.
3. Register as a dental and medical student, or this latter can be postponed until entry at hospital.
4. During apprenticeship receive instruction as above in chemistry, materia medica, and pharmacy, and pass in them at the College of Surgeons.
5. Enter simultaneously at a dental and general hospital.
6. Pass in elementary anatomy and physiology at end of first winter session.
7. Pass in anatomy and physiology at end of second winter session.
8. Take dental license at end of second year.
9. Devote remainder of time to medicine, surgery, midwifery, &c.
10. Pass, at expiration of two years from second examination, the final test of the two Colleges.

In conclusion, I should like to point out, side by side, the requirements of the curriculum for the dental license and that for the double qualification, thus demonstrating how much of the latter curriculum must of necessity be taken by the dental student, and how few the extra subjects required.

Requirements for Double Qualifications at a General Hospital.

Anatomy—One course of lectures.

Physiology—One course of lectures, three months extra practical physiology.

Dissections—Twelve months.

Requirements for Dental License at a General Hospital.

Anatomy—One course and twenty lectures on head and neck.

Physiology—One course of lectures.

Dissections—Nine months.

Surgery—One course of lectures.

Medicine—One course of lectures.

Materia Medica, Chemistry, Practical Chemistry—Done before entering school now.

Practical Surgery and Medicine—Three winter and two summer sessions.

Surgery—One course of lectures.

Medicine—One course of lectures.

Materia Medica—One course of lectures.

Chemistry—One course of lectures.

Practical Chemistry — One course of lectures.

Practical Surgery and Clinical Lectures—Two winter sessions.

Extra Work Required.

Midwifery—One course of lectures, and twenty labour cases.

Practical systematic instruction in medicine, surgery, and midwifery.

Instructions and proficiency in vaccination.

Pathological Anatomy—One course of lectures and demonstrations in post-mortem room during attendance on clinical lectures.

Forensic Medicine—One course.

Clinical Lectures on Medicine—Nine months.

Clinical Lectures on Surgery—Nine months.

Clinical Study on Midwifery—Three months.

Clinical Clerk—Six months.

Surgical Dresser—Six months.

Dr. SMITH said that the curriculum and examinations in dental surgery in the Edinburgh College were almost identical with those of the College of Surgeons of England. He had always believed in the expediency of dental practitioners taking the full qualifications of the colleges, and he was convinced that in the long run that would be the general rule. In many cases in dental practice an acquaintance with medicine and surgery was a very great advantage. An artist was always a better landscape painter if he had studied drawing from the figure along with other students in the Academy, and it would be a great disadvantage to a dentist if his studies were entirely confined to dental anatomy, dental physiology and dental chemistry, for the anatomy of the face and the jaws did not constitute the science of anatomy, the physiology of

the fifth pair of nerves did not constitute the science of physiology, neither did the chemistry of gold and the mineral substances which came under the cognizance of the dentist constitute the science of chemistry.

Dr. WATT, while thanking Mr. Smale for his excellent paper, regretted that nothing had been said about the curriculum in the Edinburgh College. Three years entirely devoted to the workroom was the least time in which the student could acquire a knowledge of practical dentistry; but to devote four hours a day during the period to classes, and then to speak of it as three years spent in dentistry, was absurd.

Dr. WILLIAMS said he agreed with the greater part of the paper, but he did not think that the regulations in connection with mechanical dentistry were at present sufficiently stringent. The three years were very often turned into a farce, and the certificate was given with great laxity. The operating part of dentistry required as much education as the mechanical. There were difficult cases which, as a rule, could only be seen in any number in a large hospital or school, and the opportunity of studying them was at present to a great extent lost to the student. He certainly thought that there should be some sort of practical examination in connection with mechanical dentistry.

Mr. HUTCHINSON said he most emphatically believed that the L.D.S. of the College of Surgeons was a sufficient qualification, but he wished to induce students during their hospital career to avail themselves of every opportunity for acquiring the higher education possessed by those who obtained the conjoint diploma. He would, however, urge the great importance of students giving their mornings to dental manipulation, and never letting the conjoint diploma interfere with their dental work. He hoped the day was not far distant when a portion of mechanical dentistry would be allowed by the College of Surgeons to be taken before the student passed his preliminary examination in arts. That was a very delicate question, and required a great deal of thinking over. They were all agreed as to the great advantage of an arts education, but he threw out the hint now—without attempting to urge its adoption—whether it might not be possible for the time the student spent in the workroom before the preliminary examination to be allowed to count as part of the curriculum.

Dr. CHARLES CUNNINGHAM thought that the country was

hardly up to the requirements of Mr. Smale's paper. Most of the gentlemen practising in the town of Cambridge, where he acted as assistant, would bear him out in the statement that there was a difficulty in getting the proper class of young men to come forward as apprentices or pupils. They could get the sons of working men, but not the class who were capable of going through the preliminary examinations necessary for the ordinary L.D.S. It would be a great step if the Association would adopt some means of informing the head masters of the schools and others who had the means of directing the youths on leaving school, what advantages might be obtained by entering the dental profession. Those advantages were not sufficiently known to the middle classes, to whom they must look for their students.

Mr. HUXLEY said the proposal that students should pass the matriculation of the London University before they attained the age of 17 would entail a very severe strain on the youths. He would rather advocate a sound examination in grammar, English, Latin and mathematics, and then the youth should be encouraged to take up one special subject, either language or science, to a higher point. He believed that a boy could not begin too early to practice mechanical dentistry. During his three years at the bench preliminary scientific subjects might very well be pursued. An hour a day would enable him to attend several useful courses of lectures, and that would lighten the curriculum later on. He would suggest chemistry as suitable to that stage, and the lectures on mechanical dentistry might surely be taken while he was working at the subject practically. Metallurgy might also be taken, and if time allowed, an easy course of physiology lectures would put him in a better position to go to his studies at the College. It often happened that apprentices dropped their reading, and had considerable difficulty in taking it up again, but his suggestion would avoid that.

Mr. W. COFFIN thought it would be advantageous if the authorities at the hospitals would give the students an opportunity of having some practice in certain departments of artificial work with which they might not come into contact during their apprenticeship. While attending lectures, they heard of different methods and ways of work which their perception might not use in the workshop, and, without making it compulsory, means might be afforded the student of availing himself of such. Among the

hospital patients their might be cases requiring nice bridge work or adjustment of apparatus for correcting irregularities. He could not help remembering the old custom of apprentices when out of their time becoming journeymen in order to have some experience in practical work.

Dr. G. CUNNINGHAM called attention to the great responsibility under which the members of the profession rested with regard to the system of pupilage. Reference had been made to the decadence of mechanical dentistry. Was it not often due to the lack of attention paid to the pupils? Too frequently a premium was accepted without a *quid pro quo* being given. Professor Stack of Dublin had introduced the American system into that city. There were good points in both systems, and the judicious thing would be a happy combination of the two. As long as they retained the three years' pupilage it behoved them to act as teachers and not merely as practitioners. He did not hesitate to say that the mechanical department in any dental hospital on this side of the Irish Channel was not commensurate with the position the profession now held, and he was glad to hear that Dr. Walker had taken the matter in hand; but practical teaching should not be confined to the mere manipulation of plates. If a man was to be a physiologist, it was not enough to listen to lectures; he must go into the laboratory and work with the microscope. So with regard to dentistry. Practical work should also include practical metallurgy, not so much about fine metals that were very seldom met with in actual practice, but a knowledge of gold, amalgam and plastic cements. With regard to the class from which the pupils were drawn, Mr. Rose, of Cambridge, had a pupil who, while working with him, had taken a degree. Such men raised the profession in the eyes of the public. He would ask all the members of the Association to do all they could to teach the public what the profession really was, and assist to bring into its ranks the best brain and physique of the nation.

Dr. SMITH said he would by no means dispense with the L.D.S. in the case of dentists, for he looked upon it as the only guarantee that a man was a dentist.

Mr. FISHER said he quite approved of the L.D.S. being a *sine qua non* for a dentist, but a practitioner might practise dentistry without that diploma. There was scarcely any other profession that required seven years' training.

The CHAIRMAN, in concluding the discussion, said the expense of a dental education was now becoming something stupendous, and he was therefore not surprised that persons of the middle classes would think twice before allowing their sons to launch out into such an expenditure if the views of some of the members were carried out.

The next paper was by Dr. George Cunningham, on

DENTISTRY IN RELATION TO THE STATE.

In the discussion which followed,

Surgeon-General DONNE said he rose with fear and trembling, because it fell to his lot to have been the editor, compiler, and in many cases the author of the recent additions to the Medical Regulations. The fatherhood of Appendix 24, however, must be put down to the instrumental branch. Experience was the great test by which they must act, and the limited equipment set forth in the Appendix had stood the test of many years, so that he did not feel inclined to interfere with it; but if his attention had been drawn to the matter two years ago, he had no doubt that he might have been able to introduce the mirror, probe, and tweezers. With regard to amalgam, gold leaf, &c., there were means by which such things could be readily replaced, and as the great object in the service was to have everything as light, simple, and economical as possible, they never issued large quantities of anything. It was quite clear that Dr. Cunningham had never made the acquaintance of a very stern Chancellor of the Exchequer, or he would know that the Medical Department was very heavily handicapped by the official authorities. It would be of the very greatest service if there could be some system by which, at Netley, a certain amount of operative dentistry could be taught; but it was quite clear that the mechanical part of the work could never be taught there. The army medical officers were already overburdened. They had to be admirable Crichtons, and to understand military law, drill and equipment to an extent which was not generally imagined. They not only had soldiers under their care, but women and children, and he himself knew what it was to have charge of a female hospital at one of the stations for a considerable time. He had had teeth pulled out both by the key and

by the forceps, and he preferred the key, though both were abominable. He was now engaged in passing recruits at St. George's Barracks, and if he were exceedingly strict with regard to the teeth the establishment might be altogether shut up, and the Inspector-General would most likely call him to account. In the country much better teeth were met with than in London. That result was probably connected with the digestive organs, because large tonsils, bad teeth, and diseased gums all went together. He most fully endorsed many of the points in Dr. Cunningham's paper, and would like to see the equipment extended as far as possible, and as far as the Chancellor of the Exchequer would permit.

Surgeon-Major BEATTIE said that the paper seemed to require that all doctors should be dentists, and all dentists doctors. He could see no way out of the difficulty, except encouraging students to get a dental education before entering the army. As a temporary stopgap, some education at Netley would be of real service; but the real cure was for all doctors to be dentists, and all dentists doctors.

Mr. SPENCE BATE considered that if the State made it an important factor that men entering the navy should have good teeth, it was but right that persons should be appointed capable of watching over and taking care of the teeth afterwards. He had had considerable discussion with naval men at Plymouth, and they had strongly supported his view. His plan was that the L.D.S. qualification should be required from surgeons hereafter obtaining army or navy appointments. No midwifery was needed in the navy, and yet a diploma in that was taken. With regard to the cost, if there were not enough men the number should be increased. While boys were refused in the navy who had lost five teeth, a larger number might be sometimes removed with advantage. He remembered an officer telling him that a surgeon on board ship on the Australian coast tried to stop a tooth with gold that the captain's wife had for gilding frames, having no idea that the gold which dentists used was quite a different thing. It was not necessary to provide army officers with such an apparatus as was used for fine stopping and coutour work, but a great deal of good might be done if the surgeons knew when a case ought to be treated by a dentist.

Dr. ARKOVY said that in the Austrian and Hungarian armies

there were no dental appointments. He was a lecturer at the University at Buda-Pesth, where, though dental surgery was not compulsory, he had from 160 to 180 students annually going up for the M.D., which was the only diploma. Of these, all except about 15 or 20 per cent. attended the lectures on dental surgery.

The further discussion on the paper was then adjourned.

A paper was read by Mr. Charters White on Photomicography; a brief discussion followed.

On Saturday morning, August 21st, the chair was again taken by Mr. J. SMITH TURNER, when the debate on Dr. Cunningham's paper was resumed.

Mr. FISHER recommended the appointment of a certain proportion of dentists, say 5 or 10 per cent. of the medical men, to the Army Service Corps, and those appointments might be residential.

Mr. BROWNE-MASON thought there was a decided feeling setting in in high quarters in the direction which the paper advocated. The commander of the Brigade Depôt at Exeter was a supporter of the Dental Hospital there, mainly, he believed, in order to get attention paid to the teeth of the men under him.

Mr. DENNANT thought that Dr. Cunningham had tried to get in the thick end instead of the thin end of the wedge. One great purpose of the Association was the education of the public, both official and general. The profession was hampered on every side, simply because the public knew nothing about it, and cared somewhat less. It appeared to him that the funds of the Association might be very well utilized in disseminating literature of a suitable character, which should emanate, not from a private individual, but from the Association. It might be scattered among the patients of the members, and sent to the governors of hospitals and medical institutions, and to the different departments of the State. A sub-committee might be appointed to take into consideration the best means of carrying out such a scheme. The public supposed that dental aid could be given just as medical aid was in hospitals, but that was perfectly impossible. A physician could sit at a table and dispose of, perhaps, thirty patients in an hour, but a dentist could not do so. Every considerable institution, such as a county hospital, should only not have its House surgeon, but also its house dental surgeon, whose services should

be paid for ; and in large towns several dental practitioners should give their services to the dental department of the hospital. That, however, could not be done until the public were prepared for it. Individual members could do so little in the direction of influencing the public mind that the Association ought to take the work in hand. If a committee of four or five gentlemen were appointed to think the subject out he was sure they would have the approval of the profession throughout the country.

Dr. HAZELDINE said that army surgeons at Netley, when they had finished their morning duties in the wards, would not care to begin stopping teeth for the soldiers' wives and children. No doubt some of them would be quite prepared to examine the mouths and then consign them to the care of dentists proper, but they would not have anything to do with dentistry themselves. For his own part, he would not stay two or three hours in the hospital stopping teeth whether he was paid for it or not.

The CHAIRMAN said they were all very much indebted to Dr. Cunningham for bringing this subject forward. Dr. Hazeldine's remarks seemed to be confined to the likes and dislikes of army surgeons. There were many things that seemed impossible that became possible under organisation, and the question could not very well be dealt with from the point of view of the likes or dislikes of army surgeons. The point was, what could be done for the teeth of those whose services were valuable to the country ; and if it should, under the exigencies of the public service, entail a little more work on the army surgeon, he did not think it would be of a very onerous character ; and the fact of their being able to do it would be a source of satisfaction and comfort to themselves. At present they were obliged to back out of it in a most undignified manner. Dr. Cunningham had clearly shown the necessity for paying attention to the teeth of public servants by referring to the condition of recruits, and that appeared to be the direction in which the Association should take action in the first instance. It would be a very difficult thing to have a teeth parade. To examine the teeth of a company of fifty or sixty men would be a very arduous task to impose on the army surgeon ; but as the short-service system was now in vogue, the inspection of the teeth of recruits might be carried out. As to the method of instructing army surgeons in some of the minor operations of dentistry, it seemed to him that the earlier that instruction was given the

better, and he should like it to be before they went to Netley. As there was some recognition of the need of dental attention to the army in the fact that a case of instruments was provided for 400 or 500 miles of country, it would be well if those who have the arrangement of soldiers' kits could be impressed with the idea that a tooth-brush was a very cheap luxury, and for twopence a brush could be provided which would last as long as the other brushes, and perhaps a little longer. The soldier always had a good dentifrice at hand in the shape of soap. Of course, impediments were always thrown in the way of any reform; but his experience was that perseverance always secured the attention of the officials to any valuable suggestion. A committee of the Association had been recommended. He had not much faith in committees. If the matter were taken in hand by Dr. Cunningham, associated with one or two others who took an interest in the work, they might receive the countenance and support of the Association, and thus some good might be done.

Dr. CUNNINGHAM, in reply, said he had not advocated that army surgeons should go in for filling soldiers' teeth, but they should have the knowledge which would enable them to say when those teeth required filling, and the means of temporarily relieving pain. He did not suggest the appointment of army dentists, but of army surgeons with a dental knowledge; neither had he advocated education in mechanical dentistry for those surgeons. In conclusion, he urged upon all members of the Association the advisability of writing to the members of Parliament for their district, in order to secure support for the proposed reforms.

After some further discussion, the following resolution was agreed to—"That this meeting is of opinion that some practical scheme should be devised which would provide a combination of dental with medical skill for all departments of the public service."

The next paper was by Mr. Fisher on

THE EXAMINATION OF THE TEETH OF SCHOOL CHILDREN.

In the course of the paper Mr. FISHER said;—I have hope of seeing the spirit of the Public Health Acts yet brought home to the ordinary intelligence of our labouring and poorer classes, so that personal sanitation may keep pace with their surroundings.

The effluvia of a cesspool cannot be more deleterious to the public health than life sustained by a mouth within which you may find many suppurating teeth, extended in many poor class districts to that of a continuous ooze of pus, and that generally confined to adolescence.

I should like to see taken up as practical questions, by some of our physiological and pathological members, whether respiration continued through such mouths may not lead to the lodgement of the bacteriæ of pus in the tissues of the lungs, and also whether the continuous swallowing of pus into the stomach is not sufficient to disorganise the structure of the blood.

What seems to me nothing short of a burlesque is that the Admiralty sets up a dental standard of excellence, and yet receives a boy *with* decaying teeth. After getting him, say at the age of fifteen, they make no effort to keep his mouth in condition, not even up to their own standard, and the consequences are that if he develops, or if any decay shows up by the time he is aged eighteen, when he is re-examined by the medical officer prior to entering as a marine, he is liable to be discarded from the service. In my opinion, this is manifestly unfair and unjust.

It used to be the habit in some of the London Board Schools that the children met ten minutes before 9 a.m. so that their hands and faces might be examined for cleanliness. In the same spirit, and with the same motive, I would have them taught to keep the inside of the face equal with its surface. The parents of the scholars attending the elementary schools take little or no interest in the mouths of their children, and the result is we have disease tolerated in the mouth that would be tolerated nowhere else, with the result that many children go off their food, as they fear the process of chewing. Now, this is entirely against the spirit of modern medical treatment, and it this I seek to remedy in asking for compulsory attention to the teeth of school children. In Leeds 90 per cent. of the teeth were bad. If such conditions exist there must be a large waste of human life, not ending in death probably, though often with far-reaching, ill effects on life, with a vast quantity of needless suffering, which, if regarded as such, would be matter for indignant human protest.

In the discussion which ensued,

Mr. ARTHUR UNDERWOOD did not think there was any danger

of bacteria being inhaled, and reaching the lung cells, and causing septic disease. Professor Lister was convinced that the lining of the air passages was a sufficient protection against such a result, unless it was suffering from disease. Neither did he think that swallowing a small amount of pus during a great many years would do damage to the digestion. As sub-editor of the journal, he thought he could promise, in the name of the Publishing Committee, that they would do their utmost to bring the paper before the public in every way at their disposal. All members of the profession were pretty well convinced of the necessity of the reforms recommended in the paper, but it was the public outside who remained to be convinced. He would therefore do his utmost to get the subject mentioned in other publications which were not strictly professional.

Mr. BLANDY heartily thanked Mr. Fisher for the very great care and ability with which he had prepared his paper, which was a practical one, and he hoped would bear much fruit. In his opinion, it would be doing good if it were printed as a pamphlet and sold at a cheap rate, and distributed among members of school boards and authorities of workhouses and orphanages. One question that arose was, how far they could get dentists to join in the proposed inspection. Would they feel inclined to leave their own consulting rooms and go among a lot of poor children, who were always more difficult to teach than the children of the wealthier classes? He did not see how the school boards, whose rates were rapidly increasing, could be got to offer a remunerative salary to dentists, and the profession must, therefore, be prepared to make considerable sacrifices. The Government acknowledged the necessity of attending to the teeth of sailors before they entered the navy, but afterwards they left the men to bear the cost of keeping their teeth in order. He hoped that the committee on Dr. Cunningham's paper would also take into consideration the subject which Mr. Fisher had dealt with.

Mr. HUET said it was most important that the public themselves should be educated as to the importance of looking after the teeth, and the best way of doing that would be to issue a large amount of cheap, sound, unprofessional dental literature which could be freely circulated in their midst.

Dr. CUNNINGHAM said that members of the profession could help Mr. Fisher in a practical way by subscribing for the pamphlets,

which he hoped would be published by the Association at a cheap rate, and seeing to their distribution. The subject of care of the teeth might also be introduced into reading books at schools. The problem of the future was the provident dental dispensary, so that the results of the profession might be brought within the reach of the masses.

Mr. FISHER, in reply, said he quite approved of popularising a knowledge of the teeth, but he had never yet met with a book which was adapted to the purpose.

Mr. GRAYSTON next read a paper on Alveolar Abscess, recommending treatment by peroxide of hydrogen. In the discussion which followed there was a general consensus of opinion in favour of the method recommended in the paper.

Mr. GORDON JONES then read a paper on Public Appointments in Medical Institutions, particularly condemning the canvassing system.

The meeting terminated with votes of thanks to the Executive Committee for the manner in which they had carried out all the details of the annual gathering.

There was again brought together a number of paintings and other works of art by members of the profession. The collection formed a very good exhibition of amateur work.

The demonstrations, conversazione, and garden party, which were included in the programme published in the August number of the DENTAL RECORD, were all successful.

THE DINNER.

On the evening of Friday, the 20th, the Annual Dinner was held at the Criterion, Sir EDWIN SAUNDERS occupying the chair.

After dinner, the CHAIRMAN proposed the health of "The Queen." Having alluded in becoming terms to the approaching Year of Jubilee, he quoted the following interesting observation made by Her Majesty, with reference to our specialty:—"Yours is the most useful profession, for while some require the services of the oculist, and a still smaller number those of the aurist, almost all, sooner or later, have need of those of the dentist."

After the toast of "The Prince and Princess of Wales, and the Royal Family," and of "The Army, Navy, and Reserve Forces,"

Mr. S. W. SIBLEY proposed "The British Dental Association." He spoke of the growth and prosperity of the Association, and the changes of the last quarter of a century. He traced those changes to the energy of certain prominent members of the profession, some of whom had passed away, and some they were pleased to welcome there that evening. He traced the existence of the Dental Diploma to a proper feeling, that whereas a general medical education was necessary to the proper practice of the specialty, it was not absolutely necessary to follow out the medical curriculum in all its details. This fact had been obvious to the pioneers of the dental movement, and had been recognised by the College of Surgeons. He thought that, prosperous as the Association was, a future of still greater prosperity lay before it. This future depended upon the profession recognising that its Association must be conducted upon broad and liberal principles. They must never forget that theirs was a branch of the medical profession, and as such had a great future before it.

Mr. F. CANTON, in returning thanks, spoke of the gratifying success of the gathering at the School of Mines, and the large attendance at the dinner that night. He alluded to the struggles of the first few years of the Association, and the apathy of the profession at large; he reminded the meeting of what they owed to the guidance of Sir John Tomes and the prodigious work done by the late Secretary, Mr. J. S. Turner. Their numbers were no doubt far short of what they should be, seeing that theirs was the only association started to carry out the provisions of the Dentists' Act, and to look after the general interests of the dental profession. It was a good and honourable thing and a duty to make some sacrifice for the benefit of the profession; and if we looked only to our own individual interests, we ought to feel that, whatever advances the profession itself, must advance them also. There were no less than seven branches, all well established and doing excellent work, and he hoped before long we should have an eighth. He had had the opportunity of approaching several members from Ireland, and he hoped before long they would have an Irish Branch. He then drew the attention of those present to the fact that the first Dentists' Register of 1879 contained a certain number of names, about 2,000, who were registered as having been in practice before the passing of the Act; 200 of these had passed away from their business in the

course of seven years, and the ratio would, in all probability, be greater as time went on.

Mr. J. SMITH TURNER, who was received with prolonged applause, in proposing the toast of "The College of Surgeons," recalled the different feelings with which he had once regarded that body, and wondered how he would have handled that toast before he had acquired his diploma and entered the charmed circle. After dwelling upon the importance of the acquisition of status and influence in its effects upon individuals and associations, bringing with it, as it did, the sobering influences of responsibility and the sense of power, he remarked, during the last twenty-five years, as Mr. Sibley has said, I think the history of our profession has been one of acquisition. When the feeling of a great want impressed itself upon the minds of the leaders of our profession, they formulated a dental curriculum, and they induced the Council of the Royal College of Surgeons to establish an Examining Board and to issue the dental diploma. That was our first acquisition, and that was the great and essential foundation upon which all recent dental progress and the progress of dental education has been built, and without that original foundation I do not believe we could have moved a step. Well, Sir, our next great acquisition was a dental hospital, or rather two dental hospitals, in London—not hospitals only to distribute professional charity, for associated with them were schools and provision made so that students might follow out the conditions of this new curriculum, and it is remarkable if we look back to find that none of the arrangements which were then made have required up till now to be fundamentally altered. Our next acquisition was the Dentists' Act. After that came the establishment of Examining Boards in Scotland and in Ireland; then we acquired the British Dental Association. We next acquired the Dental Register. In referring to these acquisitions there is one to which I wish to call the attention of this meeting, and that is the first and original one—the establishment of the dental diploma by the Royal College of Surgeons. It is not in this bare fact that they established the first dental curriculum and issued the first dental diploma in England that the amount of our indebtedness to that College is to be found. We must remember, that when the College entered into this course, it did so almost as an experiment, in the face of a considerable amount of opposition and at the expense of much self-sacrifice. The opposition

sprang partly from many in our own body, but also from the medical press generally. Now, this opposition, I am happy to say, is dying away. I know that it exists still, but it is in a kind of suppressed state of existence, reminding one somewhat of Rachel weeping for her children, who would not be comforted. I hope that the logic of facts and the soothing influence of time will do away with that opposition altogether, for I think we are trying to show that we are worthy of the confidence which the College of Surgeons reposed in our leaders. There is another point which shows our indebtedness to the College of Surgeons, of which I would like to remind this meeting. I mention these facts because we are liable, in the enjoyment of present arrangements and in the enjoyment of present facts, to forget the inception of them, and to forget the conditions from which they arose and the difficulties through which they passed ; and we are liable to give to contemporary institutions that credit which alone belongs to the great pioneer which worked the essential change from which so many other successful changes have arisen. Well, this other condition was this : The Dentists' Act was passed through Parliament at a very small expense ; but you must not suppose, gentlemen, that the College of Surgeons got its work done for it under the same conditions. The College of Surgeons, when it took up the position which it did in establishing a dentist's diploma, had no Dentists' Act to back up the step which it took. On the contrary, it had to go to Parliament to obtain permissive legislation to issue a dental diploma, and the College did so at a very considerable expense. Not only had it great opposition to contend against, but it had very considerable pecuniary expenses to meet, and I think I am within the mark when I say that it is very doubtful if even yet it has reimbursed itself for the preliminary expenses which it incurred in the establishment of that diploma. Now, if we consider the position we were in then, and the way in which the College of Surgeons behaved towards us, I consider that we are indebted to the College of Surgeons in a way which we cannot well express. What I have stated is a mere outline of indebtedness which we owe to this great institution. I know well that it was only following its traditions in what it did. I know that it saw an opportunity of improving the education of a very important branch of the healing art, and thereby serving the public, and that it was only acting then as it has frequently acted on other occasions,

when it stepped forward to assist the dentists in providing them with the education which they required. And, gentlemen, during all the years in which the Royal College of Surgeons has administered the provisions granted to it by a permissive legislation, which had no protection whatever, it has never once betrayed its trust. It has never once shown any inclination whatever, either under the name of assumed liberality or with a desire to procure more candidates for the diploma, to lower the character of that diploma. On the contrary, it has always shown the utmost jealousy to protect it, and to maintain it in the high position which it occupied at first. One more word : there are a large number of dental students who fulfil their curriculum in London, and who, for some reason or another, do not come up to the College of Surgeons for their diplomas. Now, I think, from patriotic feelings alone, these gentlemen who study in London should try to come up to the College of Surgeons of England, and not go further afield for that which is so near at home, and which will be to them a life-long possession of pride and satisfaction. Professor Marshall is well known to everyone here. He occupies the very highest position in the profession to which he belongs. He is a member of the Medical Council, and I look upon his presence here to-night, and upon the presence of one or two other gentlemen sitting to the right and left of our Chairman, as a good sign, and as a token of encouragement to us to go on in the path which we are pursuing. We must remember that a very few years ago we could never have secured the countenance of such gentlemen as I refer to. That is the great step that our profession has made. I hope the College of Surgeons may long stand between the public and the pretentious grievance of charlatans. I hope the College of Surgeons will never regret the step which it has taken in supporting the cause of dental education ; and I hope, further, that it will always have upon its council such men as Professor John Marshall, whose name I ask you to couple with this toast.

Mr. JOHN MARSHALL, in returning thanks, said the real credit of the council of the College of Surgeons in this particular matter is due to the exertions, and to the persistent exertions, of one of the most straightforward, strong-headed and honest men that I ever knew, Mr. John Moncrieff Arnott, that this question was taken up seriously in the council of the College of Surgeons.

Subsequently he obtained by degrees the support of another distinguished man, who was at one time president also of the Medical Council to which Mr. Turner has alluded, I mean Mr. Joseph Henry Green. Then that admirable and keen-sighted member of our council, the late Sir William Lawrence, took up the running, and with three men like that upon the council, you may understand that it was utterly impossible for any other members to resist their persuasion for long, and so at last the College of Surgeons came to offer to you a fellowship which would give dignity to your profession, but at the same time confer, as it were, immortal honour on itself. For when you speak of a possible severance of your relations with the College, we must understand the feeling of the present day is not in favour of separation but in favour of federation, and although it is just possible that the wheel of fortune may turn round, and in the course of a century or two you may possess an admirable corporation of your own, your own council, your own charter, your own diplomas, and secede from the College of Surgeons, still as long as the English nation stands, and the British people continue, we shall always have what I say is the immortal honour of having in the first instance set you upon your feet. With regard to the conduct of the examinations of the College, nothing gives a member of the council, who has a taste for examining, greater pleasure than to take his turn at the Dental Board, and I am quite sure the examiners of our College not only welcome the co-operation of examiners drawn from your profession outside of the council, but they find valuable assistance in the practical knowledge which those gentlemen bring to bear, in order to put the students through their proper technical tests. Working, then, as the Dental Board of Examiners do, scientific men with a broad knowledge of anatomy, physiology and surgery, side by side with those who have acquired a capacity to deal technically with dental work, we have as strong an Examining Board at the College of Surgeons as can be desired; and so long as that is the case, it appears to me that no improvement is at present possible in the mode of getting your diploma. I am speaking now, of course, of the dental license. An increasing number of your profession are endeavouring to obtain the Membership of the Royal College of Surgeons. Naturally, some of those who possess your license will want a still higher distinction: they will want it for themselves, they will want it for the public, they will want it for their own prosperity; and I am sure that the

College of Surgeons will do everything that it possibly can to favour any steps towards the improvement in the education and training of your profession. I was very much struck by a remark made by your Vice-President, Mr. Turner, in one of his addresses, that he did not like the idea of a man being a surgeon first and a dentist afterwards, but that he should be a dentist first and a surgeon afterwards. When I first read that sentence I shrugged my shoulders; but the more I think of it, the more I think it must be so. I think it is impossible for a surgeon, as has been remarked to me by Sir John Tomes this evening, when he is fully equipped as a surgeon, to acquire the technicalities, the handicraft, the dexterity, the muscular power, the finger power, touch, and so on, that the dentist requires in the practice of his fine art.

Several other toasts followed, and the evening's subscriptions to the Benevolent Fund amounted to £43.

A FATAL CASE OF PYÆMIA FOLLOWING ALVEOLAR ABSCESS.

M. PONCET, in a communication to the *Société de Chirurgie*, relates one of those rare cases of pyæmia due to alveolar abscess. The patient, who was of intemperate habits, had been ill about ten days before admission to hospital, and showed signs of severe constitutional disturbance. Locally there was a large, non-fluctuating swelling at the angle of the jaw. The following day the outer surface of both forearms became œdematous, and large bullæ formed. Death took place forty-eight hours later. At the necropsy numerous small abscesses were found under the right side of the lower jaw, and along the upper half of the sternomastoid of the same side. The cellular tissue of the forearms was infiltrated with purulent matter, the spleen was pulpy, and the liver fatty and cirrhotic.—*The Lancet*.

OBITUARY.

ON September 28th there died, at Kilburn, Henry Tattershall Knowles Kempton, aged 66 years. He was an L.D.S.Eng. *sine curriculo* 1863, and was a Member of the College of Dentists, an institution which was united to the Odontological Society in 1863. For about forty years he carried on an active practice, during the

greater part of the time being associated with Mr. G. J. Williams, at 17, Cavendish Place, W.

His genial manner endeared him to all who knew him. He was one of the pioneers of the dental reform movement, and one of the founders of the National Dental Hospital, and for many years a member of the staff. He found time amidst the calls of a busy practice to attend to the secretarial duties of the Metropolitan School of Dental Science, the first school of its kind established in London, and now merged into the National Dental College. By the lecturers and students of that school he will be remembered as one of the kindest of friends and advisers—never thinking of himself when the benefit of the school was in question, and having a kindly answer for all inquirers. He was the author of several papers on points of practice, as well as a small volume on the “Elements of Anatomy of the Teeth,” &c. He had been out of active practice for some years, owing to ill-health, but he never lost that patient urbanity of manner which characterised him, and that hope that sustains all Christians never left him. To the last he was wishing to join the heavenly choir, and sing the praises of Him who is the manifestation of the light. His end was, indeed, peace.

WE regret to announce the death of John Bernard Magor, L.D.S.Eng. 1879, which occurred on August 31st. During his studentship at the Dental Hospital of London he obtained the Saunders' Prize, as well as several other prizes at Middlesex Hospital. Some little time since Mr. Magor underwent an operation by Sir Henry Thompson, but he gradually succumbed to the disease.

It is with great regret that we learn, just on going to press, of the sad death of Thomas Mahonie, of Sheffield. Whilst driving on Friday (the 1st inst.) he met with an accident which was quickly followed by fatal result. Mr. Mahonie was L.D.S.I., 1878, and a late member of the Representative Board of the British Dental Association, he having been present at the recent annual meeting. In the town of Sheffield, as well as in the dental profession, he was much respected.

Editorial.

LITERARY SHORTCOMINGS.

THE story, "Thurley Tighe," which has for almost two years been appearing as a supplement to the DENTAL RECORD is now nearly concluded. From time to time references have therein been made to numerous topics, certain of the observations having cogent pertinence to existing conditions and institutions connected with the dental profession. In Chapter XXI. there are allusions to many circumstances that are worthy of the attention of students, of practitioners holding hospital appointments, and also of dentists in general. We would emphasise the statement made at page 168, that "at the present day we are all prone to consider everything as common place, but nothing to my mind proves the weakness of our observations more clearly than the few published records coming from the hospital surgeon. Even supposing that little that is actually novel should appear, the learner at least should refresh his memory, and as everything in nature repeats itself, so in health and disease something can be gleaned even from 'a twice told tale.'"

There is, unfortunately, too much cause for such an accusation. They who hold positions of that kind are generally elected on account of their special qualifications for these offices. But it is a notable fact that, as a rule, they who occupy dental appointments at general and special hospitals communicate very little, too often nothing at all, either to our periodical literature or to our societies. This ought not to be. Dental surgeons at hospitals have opportunities for observation that are not presented in private practice. To them much is given, and more is expected and required.

GOSSIP.

PROFESSOR A. H. NEWTON in his Presidential address to the American Association for the Advancement of Science said:— We cannot look to the moon, nor to the earth, nor to the sun, nor to any of the large planets, nor to a broken planet, as the first home of the meteoroids, without seeing serious if not insuperable objections. But since some of them were in time past certainly connected with comets, and since we can draw no line separating shooting-stars from stone-meteors, it is most natural to assume that all of them are of a cometary origin. It seems strange that comets break in pieces, but astronomers admit it, for it is an observed fact. It is strange that groups of these small bodies should run before and follow after comets along their paths, but astronomers admit it as fact in the case of at least four comets. Astronomically there would seem to be no more difficulty in giving such origin to the sporadic meteor, and to the large fire-ball, and to the stone meteor, than there is in giving it to the meteor of the star-shower.

THE Crater Lake in Oregon, U.S.A., has been ascertained to have a depth of 1,996 feet, the average being 1,490 feet.

MR. ALFRED PRAGER, L.D.S.I., has been appointed Dental Surgeon to the Pimlico Road Free Dispensary, *vice* W. H. Lovejoy, M.D., M.R.C.S., deceased.

As President of the Anthropology Section of the British Association, Sir George Campbell said:—"Then as regards man-breeding. Probably we have enough physiological knowledge to effect a vast improvement in the pairing of individuals of the same or allied races, if we could only apply that knowledge to make fitting marriages, instead of giving way to foolish ideas about love and the tastes of young people, whom we can hardly trust to choose their own bonnets, much less to choose in a graver matter in which they are most likely to be influenced by frivolous prejudices. As I am not preaching, I need say no more on that—all that I could say is self-evident."

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THE ELECTRIC LAMP.

By THOMAS ROWNEY, L.D.S.Eng.

THE electric lamp, in its application to dental operations, is one of the most beautiful and useful contributions of modern science to the wants of the dental surgeon. It is the best substitute for that euphrasia for which he has so often longed, which should give an increased power to his vision when uncanny cavities, difficult of access, are presented for treatment.

May be, it is a second lower molar, standing high above its fellows, whose distal cervical surface is the seat of decay, into the recesses of which a reflected ray of ordinary light can scarcely penetrate, even at mid-day with a bright sun shining overhead, much less on a cloudy winter's day. In such a case, the electric light, from a well-constructed instrument, will reveal the deepest depth, and enable the operator who desires conscientiously to do his work, to do it with the minimum of discomfort to his patient, and with the least amount of fatigue to himself.

In operating on cavities in the buccal surfaces of molars, both upper and lower, particularly in the *dentes sapientiæ*, the lamp has an especial value, and we might enumerate many other cases in which it can be used with the greatest advantage. Some little practice may be necessary before the required dexterity in its management is attained, but the educated hand so readily responds to the educated will, that to him who tries and tries again all things are possible. We see just so much as we bring the ability to see, and bringing this new and additional power to aid us, we cannot fail to see more and see it better.

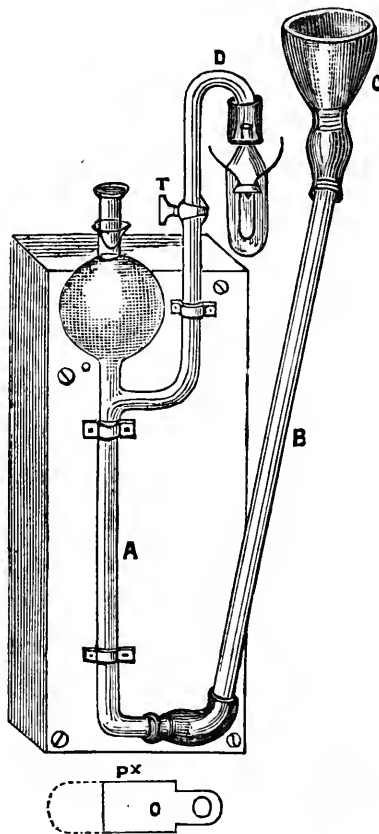
No directions can be laid down, and, indeed, they are not necessary; for beyond the occasional cutting off of the current to prevent any unpleasant consequences from the little heat which is developed, all may be left to the judgment of the operator.

Let us consider separately the lamp and the lamp holder, for on their construction, particularly the latter, the value of the instrument depends. The lamps are made in two forms, the bulbous and the conical. The one shown in Fig. 1, p. 488, of full size, is best suited for our purpose. It can be obtained from the Dental Co. for a few shillings, and should be unmounted, as the usual form of mount does not readily lend itself to our plans. The mount I prefer is made of ebonite, which should be worked to Fig. 2, which shows it the exact size when finished. A piece of ebonite rod, 3 inches long, may be put into a scroll chuck, and with a twist drill a shade larger than the cylindrical portion of the lamp, a hole is to be bored equal to the whole length of the lamp. The tube is then to be turned down for half an inch to the shoulder, leaving the tube the thickness of a No. 9 gold-plate gauge. Cut off the piece to the length of the hole and rechuck by the shoulder-piece, and turn out the tube until the lamp, with the platina wires—which must be laid close—will slip easily into it and project through the smaller end about three-eighths of an inch. Reduce the outside until the thickness is the same as the other end, and cut off any excess in length, so that the lower end of the lamp is flush with the tube. The shoulder must be retained, as it is necessary for insulating the mirror from the holder.

Two pieces of very thin brass tube are fitted to the lower part of the ebonite tube, close up to the shoulder and long enough to project a quarter of an inch beyond the lower end, where they are to be bent at right angles, covering the end of the lamp. In each of them a hole is to be punched, and the platina wires brought through them and soldered with soft solder, after having attached the brass pieces to the ebonite with shellac. Care must be taken that the pieces do not touch each other.

The construction of the lamp and the principles involved in obtaining light from it have many points of interest. Into the glass tube, at two opposite points in its diameter, is fastened by fusion of the glass a piece of platina wire. The portions within the tube are kept apart by a bead of glass, and at their upper ends they are connected with a fine thread of carbon. Platina is used because of its infusibility, and because its rate of expansion corresponds so nearly with that of glass that the union of the two is more certainly assured. Carbon is used for completing the connection because of its infusibility and its smaller capacity for heat,

two essentials which are not so well fulfilled by any other known substance. But carbon, when heated to redness, readily enters into combination with the oxygen of the atmosphere, and is converted into carbonic acid gas. Hence it is necessary that the air shall be withdrawn from the tube. This is done with a Sprengel's pump, whose exhausting power is derived from the weight of a column of mercury, which in its descent drags out the air until the tube is practically empty. It is then hermetically sealed by suddenly fusing the lower end of the tube with a blow-pipe jet, by which the re-entrance of air is prevented.



The pump, as modified by Mr. Lane Fox, and used by him in exhausting the glow lamps which bear his name, is shown above. A is a glass tube, whose upper end is expanded into a bulb, which is closed with an accurately ground stopper. The lower end is bent at right angles, and is connected with another tube, B, considerably longer than A, by a flexible joint of rubber tube. At the upper end of B is an open vessel, also connected by a flexible joint. A short distance below the bulb is a branch tube, D, having a tap, T. To this tube is attached the lamp from which the air is to be drawn.

The action of the instrument is as follows: Mercury being poured into the vessel C until the bulb is filled, the stopper is inserted, and the tube B is depressed until the mercury falls some distance below the point of union with the tube D. This produces a vacuum in the bulb into which the air from the lamp rushes. The tap is then closed. The vessel C is again raised until the joint is covered, when the stopper is removed to allow the air to escape. It is then replaced and the process repeated until a perfect vacuum in the lamp is obtained.

If connexion be made with the platina wires of such a lamp and the terminals of a galvanic battery of sufficient power, the filament of carbon becomes incandescent and will remain so as long as the proper conditions are maintained; but why it does so will require a word or two of explanation.

If a piece of iron be hammered on an anvil it will become hot if the force of the blows and their frequency be well timed. Here we have an example of work and arrested energy being converted into heat. In the battery we have a plate of zinc and chromic acid and sulphuric acid; work is done by the latter, for they tear asunder the molecules of zinc which were held together by some mysterious force to which has been given the name cohesion. Possibly it is that force which is transformed by chemical action into electrical energy. If this cannot escape from the battery, heat is developed within it; if it can escape, it passes through the conducting wire or sets in motion something which exists in it until it reaches the small black filament of carbon. Here, finding great resistance to its passage, it shows itself as heat energy.

If a small sphere of iron, free to travel along a smooth plane, were struck with a hammer every second in its course for several minutes, it would be moved through a considerable space at a certain varying velocity; if the same sphere, fastened to the plane so that it cannot move, be struck with the same force and same velocity, we shall have instead of motion a conversion of the energy into heat. That which we see in the iron we see in the lamp; we see it also in the flash of lightning and in the arrest of the railway train by the Westinghouse brake.

There is in nature a constant tendency for energy to assume such a form, and to become so distributed that it is no longer available for mechanical work—possibly it undergoes a degradation; it may be that its vibrations become less in a given time, or less

in extent, or both, as a step in the process of dissipation until the equilibrium disturbed in the battery and in the iron sphere is restored.*

The electric light was first used for exploring the oral cavity by Dr. Bruck, of Breslau, in 1867. What form of lamp he used I have not been able to ascertain; most probably the incandescent filament was of platina, or iridium, but whether or not it was included in an exhausted globe does not appear. Later, Millot, of Paris, lighted up the stomachs of animals, and subsequently instruments were devised for examining the larynx, bladder, uterus and other organs, but they did not appear until Swan had given to the world his beautiful carbon filament lamp, which marked a new era in the history and development of the electric lamp. To the miner, the microscopist, the surgeon, and the diver, it now lends its aid in carrying out their investigations.

We are indebted to the Russian physicist Wilde for the knowledge, that carbon has at equal temperatures, a greater radiating power than platina or any other metal, and further, that having a much smaller capacity for heat than either, an equal amount of heat will raise it to a higher temperature, and so it will give out more light.

On this substructure other labourers have built their successes, patiently working out and overcoming a host of difficulties in the manufacture of the carbon filaments, Swan in England and Edison in America being in the van—their names now household words in connexion with glow lamps. The former employs carbonized filaments of spun cotton, the latter carbonized filaments of bamboo.

The preparation of these are examples of beautiful manipulation. We might as well recount the twelve labours of Hercules as enter into all the minutiae of their manufacture; it must suffice to say that Swan carbonizes his cotton filaments by the action of sulphuric acid diluted with half its measure of water, and after carefully freeing them from the least trace of acid he passes them through a draw plate to ensure uniformity and make them cylindrical. This form gives more light than any other, because it exposes less surface to cooling influences. They are then wound on rods of porcelain or carbon and submitted to a white heat in a clay muffle filled up with powdered charcoal.

* See this worked out by Prof. Liveing in an admirable essay just published.

The bamboo filaments of Edison are carbonized by heat only. The arrangements for ensuring uniformity of size and shape are so much like those of Swan that no description is necessary.

These filaments are attached to the platina wires in different ways by different makers; one flattens the ends of the wires and converts them into tubules into which the filaments are inserted tightly, while another attaches them with a cement made of Indian ink. A host of little schemes have come from fertile brains and deft fingers, all having one common end—a perfect contact between the carbon filament and its platina supports.

The general reader who takes up a book on the electric lamp is met at the outset with terms whose names tell nothing of their meaning. Important as they are to a clear apprehension of the subject, they are so frequently hedged about with abstruse language that they are hard to be understood. Lamps differ in the amount of resistance they offer to the passage of the electric current. This is stated as being so many ohms. The resistance of our telegraph wires is about 13 ohms to the mile, and it is by means of these ohms that the position of a breakdown in a submarine cable can be located with certainty. It will be seen, then, that an ohm must be a known measure, an equivalent to a known force, a measure of energy as opposed to a resistance.

No known substance is capable of allowing a current of electricity to pass without offering some resistance to its passage. Copper is the best known conductor. If we represent its resistance as $= 1$, then iron offers nearly $5\frac{1}{2}$ times the resistance of copper, platina nearly $6\frac{1}{2}$ times, mercury 50 times, and carbon 3,000 times, at the average temperature of the atmosphere; and while heat increases this resistance in all the metals, in carbon it decreases it.

A column of mercury nearly 42 inches long and nearly $\frac{1}{5}$ th of an inch square section, would offer, as seen from the foregoing statement, a known resistance. This is the measure of the legal ohm as fixed by the Electrical Congress.

A lamp is stated as being so many volts with so many candles' power. The dental lamp is about $2\frac{1}{2}$ or 3 candles' power to 3 volts; that is, it requires 3 volts of electricity to develop its greatest lighting power. Now, each of these volts is produced by the consumption of about $18\frac{1}{2}$ grains of zinc per hour in a Daniel's battery. The volt, then, may be taken as the unit of

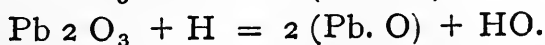
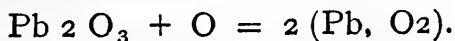
electromotive force. This, in a circuit whose total resistance is one ohm, produces a current of one ampère, and this ampère will deposit electrolytically nearly $20\frac{1}{2}$ grains of copper per hour. The ampère may be taken as the unit of current.

It is easily seen, then, that by weighing the zinc plates of a Daniel's or any other battery before and after an hour's action, the number of volts can be readily determined, and on these and the other data can be calculated the power necessary to develop any amount of light, and also its cost.

Where the electro-dental engine is not used, a secondary battery or accumulator may be employed in working the lamp. There is a charming little arrangement for this purpose sent out by the Dental Company which gives for a time very satisfactory results with lamps of low resistance. It is, I suppose, constructed on the lines of Planté as modified by Faure, with two or more plates of lead upon which is spread a coating of red lead. These are enclosed in a cell containing diluted sulphuric acid, which is sealed, two pin holes only excepted. When such an arrangement is connected for some time with a dynamo-electric engine or an ordinary battery of sufficient power, it becomes highly charged with electricity: an electric storehouse always ready to give up its energy when attached to the lamp. The principle upon which it works, is the superoxidation of the red lead on the plate which corresponds to the zinc plate in an ordinary battery by the oxygen set free in the decomposition of the water contained in the cell, and the abstraction of oxygen from the red lead on the other plate—the negative—by the hydrogen, which is also derived from the water.

In the one case the sesquioxide of lead becomes a dioxide; in the other it becomes a monoxide.

In this state the accumulator will furnish a current until the equilibrium of oxidation is restored, and each again becomes a sesquioxide.



It is a pretty example of that correlation of the physical forces which pervade the universe and keep up the circle of change—never at rest, they are ever striving to maintain a balance, which is but, a transition to a new state of unrest.

Turning from the physical to the mechanical aspect of the

insure a smooth movement in the joint, is to be fitted into a half-round notch in the end of the longer tube, taking care that it is at right angles. This must be nicely attached with hard solder. The length of the stem, B, measured from the centre of cross-piece, A, should be not less than $4\frac{1}{2}$ inches. A piece of drawn brass rod, 1 inch long, the exact size of the inner diameter of the stem, is to be soft soldered in at the other end.

With a thin circular saw, divide the stem lengthwise into two equal parts. Before this division is completed, fit into the saw calf two pieces of hard vulcanite; they will be necessary when the sections, X and Y, are put together, and the fitting should be done at this stage to ensure the tube being true when completed. Drill three small holes in each half tube at equal distances, and solder into them in the concave sides pieces of brass, $\frac{1}{4}$ inch long. Bend all these at right angles, taking care that they do not touch those in the other half tube when they are put together. See that the half-round pieces with which the ends are fitted are well soldered. Fill each half tube with black rubber, placing the pieces of hard rubber already fitted at equal distances.

The piece between the right angle ends must be large enough to cover the holes and reach half an inch down the stem. This will prevent the rubber filling them during the hardening. Press the stem pieces together in a vise, using two pieces of soft wood, bind with wire, and harden in the vulcanizer. The stem should be turned up, using a slide rest tool if a very good finish be desired. The handle, C, is made from a piece of $\frac{1}{2}$ inch ebonite rod of the size shown in the drawing. When the stem has been fitted to this, a hole must be drilled at D through the handle into the brass and tapped, taking care that the layer of vulcanite is not perforated. On the opposite side is the connecting piece, E, of German silver, which is attached to the solid half-round end by a screw. When this is done the stem is to be withdrawn from the handle, the half-round piece to which the connector is attached is to be sawn through at F, so that its continuity with the stem may be broken, only to be restored when the connecting spring is pressed upon. Replace the stem in the handle, insert the screws, and then proceed to drill two holes through the end of the handle, entering the solid ends of the stem; here a little extra care will be needed, using a fine drill to ensure the right position of the holes. If that has been achieved in the first attempt it may be followed by a drill of the proper size,

and the holes in the brass ends are to be tapped with a good thread to the depth of three-sixteenths of an inch. The screws, G G, are of hard drawn brass, shouldered so that they may bite firmly the ebonite handle. In each of these is a transverse hole K, into which the studs of the spring piece attached to the leading wire are slipped. The spring piece is so simple in structure that no description is needed. It is of hard rolled brass, and each piece must be attached with soft solder to the leading wires, taking care that perfect insulation is maintained by a piece of hard wood, to which they are to be bound with waxed silk, which may be coated with shellac varnish, to make all firm.

The trunnions, H, may be next fitted; these are made from hard brass wire and should be drilled and tapped while in the lathe, and the screws fitted and finished before removal from the chuck. They must be ground into their sockets with Turkey dust until they move smoothly while they fit tightly.

The pieces, P P, forming the clip which holds the lamp firmly, are of German silver; they are cut from a thin tube, and are attached to the disc of ebonite by steel screws at X X; care must be taken that the points of these screws do not touch each other, or insulation will be destroyed and the lamp will not work. It is through the holes in the tongues of these pieces that they are to be attached to the stem, by the trunnions and screws. To the upper shoulder of the lamp holder a ring, K, is fitted tightly enough to prevent slipping. To it, with soft solder, is attached the piece, L, which may be further fastened with a screw by drilling through the ring at X. The length of P must be such that the mirror shall be at a convenient distance from the lamp; this will be determined by its focal length. A short focus mirror is the best. The length of L being fixed on, a hole is to be drilled through it, parallel to the lamp, and a pin of hard brass with a shoulder, fitted to it. The part which passes through the hole is to be threaded, and a dainty little washer and nut will hold it tightly and yet allow of any adjustment which may be necessary. To the other end of it is attached, by screws and steady pin, the mirror box. The mirror can be purchased. It should not be larger than a fourpenny piece. The box which holds it is easily made from a piece of sheet brass, turning out the cell with a side rest tool, or even by hand. While fitting the mirror it can be held with a stick of beeswax. The edge of the cell must be turned down until so thin that it can be

burnished over after the mirror is inserted. The fittings may be nickel or silver-plated after polishing.

We must revert for a moment to the battery. Directly under the end of the lever by which the plates are depressed there is, an inch or more from the bottom, a brass pulley. Through this is roven a piece of whipcord, one end of which is attached to the lever at the same point as the cord of the treadle. Into the side of the lid a stud is screwed. The plates being completely immersed, a ring is to be attached to the cord, which, when passed over the stud, will keep them in position. It will be very useful when the operator finds it necessary to stand on the left of his patient, when using either drill or mallet. The connection with the lamp being made, the plates should be carefully depressed until the maximum of light is obtained, when another ring should be knotted on the cord at a point corresponding with the stud and the immersion of the plates.

Before using the lamp, this ring is to be passed over the stud, upon which it may remain during the time of operating, without interfering with the working of mallet or the motor. As the lamps made by different makers vary in their resistance, it is a matter of experiment to determine the amount of battery power necessary to develop the best effect without destroying the carbon filament. This is attained when the resistance in the battery equals the resistance in the lamp, and unless this balance is secured, there will be waste of battery power or deficiency of light.

Some lamps in my possession are of such high resistance that 6 volts at least are necessary to produce the maximum light, while others only require 3 volts. It is here the value of the switch, described in the article on the Electro-Dental Engine, in the August RECORD, will be found, as through it every necessary adjustment can be made for lamps with resistance coils and for those constructed without them.

It will be interesting to those who are trying the chromic acid formulæ to learn that in the writer's battery the solution has been resuscitated three times with chromic and sulphuric acids, and that it has yielded not less than 90 hours' work. It is now beginning to show signs of failing power, and the time has come when the solution must be poured away.

A LOGICAL INFERENCE.

By FRED. A. BELLAMY, Streatham.

A GENTLEMAN, aged about 40, of exceptionally fine physique, consulted me in the early part of 1885, complaining of suffering excruciating neuralgic paroxysms in the right facial and temporal regions at irregular intervals—once or oftener—during the day and night. He had visited two dentists (one of high repute) who had extracted two sound teeth—having, as they asserted, diagnosed exostosis, which proved upon extraction incorrect—and the operations caused no modification of the pain. Patient, who had prior to this been under the care of a general practitioner, and was still undergoing systemic treatment, at this stage consulted me—some three weeks subsequent to the last of the former operations. His anguish was temporarily relieved, as he assured me he could now localise the seat of pain in the right lower six-year molar. I carefully examined the tooth he indicated, as also all the others, but could not detect a trace of decay in any of them, and they all responded freely to the thermal test. He appeared so elated at being able himself to positively centralise his trouble in the said tooth, that he insisted upon having it immediately removed, observing “he had already suffered enough in the interests of science, and now he would like to have a word in the matter himself.”

Persisting, naturally enough, on this line of argument, I, though loth to do his bidding, extracted the condemned tooth under gas, but to my disappointment found it, on examination, perfect in every particular. He left apparently satisfied that, at least, he had had his own way, and I saw no more of him till about a year after, when he again called upon me to ascertain if there was a “fish-bone” stuck in his *left upper* six-year molar. I failed to discover any foreign matter in the tooth or its vicinity, but found I could introduce a fine probe in a crown fissure of the same tooth, and by my advice he returned the following day to have it stopped. Before commencing operations, I inquired whether the former neuralgic pains had disappeared. He told me that as the last extraction recorded above effected no benefit, he lost faith in dental assistance, and consulted first one, then another of our most eminent physicians and specialists; but no relief could they

extend to him, till the last one he consulted required him to sever himself from London and business for a while and retreat to the mountains of Switzerland. This advice he followed as a *dernier ressort*, dwelling for a few weeks in a village situate at a great altitude, where the rarified and pure atmosphere invigorates the nerves to a healthy reaction. After a few days' sojourn, he said the effect was marvellous; those awful paroxysms totally disappeared, he felt another man and "lived" again.

Contenting myself with the examination of the previous day, I immediately set to work to bur out the fissure, and after nearly impinging upon the pulp chamber without obliterating the crevice, I ceased excavating, suspecting the tooth might be cracked instead of attacked by caries—a suspicion that a closer examination confirmed—for I found the tooth split through its entire length, the two buccal roots being attached to the one half and the palatine to the other—the two halves being very slightly individually mobile. As a matter of course there was no vitality existing in the pulp, so I tightly bound the tooth around its neck with !gold binding wire (the neck being too constricted to allow a collar to be slipped over the crown), and having further excavated the two halves after a dovetail fashion, inserted a filling of Sullivan's cement, and I believe the operation may be pronounced a success.

Now, would it be a very illogical hypothesis—no new one—to assume that that identical tooth was the origin of all the agony the patient had endured; the pulp having sphacelated, the gases generated by which found no exit, till the tension on the surrounding walls was greater than the natural cohesion of the molecules of the tooth-substance could resist, when they separated to allow the pressure to diffuse itself? I was informed by the patient that he had never used his teeth rashly, nor could he recollect any particular sensation at any time in connection with this tooth, save on the occasion when he imagined a fish-bone had become fixed in it. Might one not even go so far as to deduce from the history of the case, that his relief dated from the bursting of the tooth, which took place at the Swiss village, and which was possibly caused or accelerated by the altered climatic conditions surrounding it at that time?

There is, as I have stated, nothing novel in this—on the contrary, the theory here propounded is antiquated—nor is there

attached to either of the incidents here chronicled any special interest, if taken separately; but studied conjointly and in their sequence, it decidedly, I think, confirms the legitimate conclusions of yore, as to the power of the gas evolved from the disorganised pulp tissue within a tooth.

A PROFESSIONAL HOLIDAY

By GEORGE CUNNINGHAM, B.A.Cantab., D.M.Harv.

SOME time ago I became interested in Dr. Arkovy's work on "Differential Diagnosis of Dental Diseases," but soon became convinced that perhaps the shortest way in which to acquire a knowledge of his special system of classification was the acceptance of his invitation to visit him in his far-off home in Budapesth. As I was also fortunate in gaining fresh professional experience, on my return journey I have thought that a slight sketch of a professional holiday might not be without interest to at least some of the readers of the DENTAL RECORD.

A few days after the British Dental Association meeting I started with Dr. Arkovy on his return journey. We made a rapid journey through Brussels to Vienna, stopping only to spend one day at Nuremburg, certainly the most interesting of all old continental towns. As all Dr. Arkovy's professional friends in Vienna were still away on holiday, we hurried on to have a few days in the Carpathian mountains to recuperate from past fatigues. Soon after leaving Vienna I quickly recognised the fact that we were out of the beaten track of the British tourist. The journey to the Hungarian mountains is extremely interesting and picturesque, especially that part of the line which follows the valley of the lively Popper. Much as I would like to recount our various exploits in the mountains, to dwell upon the beauties of Csorba To (a lovely mountain lake) and to descant upon the glories of the Tatra mountains, not the least of which is the Lomnitzer Spitze, from whose lofty summit, some 2,635 mètres above the sea, I gazed upon the far-off land of Poland. I must be content with strongly recommending this favourite and fashionable Hungarian resort to those who are in search of health, fine scenery and picturesque surroundings without the presence of the sometimes too ubiquitous English or American tourist. The descent from the mountains by the zigzag railway to the lower

plain of Hungary would have been enjoyable but for the oppressive heat.

On arriving at Buda-Pesth I found it more than fulfilled all the glowing descriptions we had had of the most enterprising city of Eastern Europe. It adds to the usual characteristics of a European metropolis a certain indefinable air of the mysterious Orient; and is picturesquely situated on either side of the Danube, which, by the way, is not blue but very yellow—hence the “blonde Danube” is the loving appellation the Hungarians give their noble river. The architectural and ethnographic features of the city are very striking. Its half-a-million inhabitants include large sections of Slavs, Germans, Servians, Roumanians, Bulgarians and Jews. Prominent amongst its many fine buildings is the Medical School of the University, a magnificent teaching institution. One could not help contrasting certain institutions of our own with those of the recently resuscitated kingdom of Hungary; the Physiological Institute and the Anatomical School, for instance, are princely institutions, compared with which the similar departments in most of our medical schools are beggarly in the extreme.

The most interesting part of Buda-Pesth for me, however, was the quaint old-fashioned house, the mezzanine floor of which is occupied by the Public Dental Institute, founded by Dr. Arkovy in 1881. Before describing this institution, it may be well to give an idea of the present condition of the dental profession and education. The Hungarian dentists may be divided into two classes; first, the medical men practising dentistry, and secondly, those who may be perhaps best defined as skilled or unskilled artisans in dentistry. For the education of the latter no provision is made by the State, which has as yet made no recognition of dentistry as a special profession. Several of them, however, by acquiring dental training abroad, are fully equipped with the resources of modern dentistry, and may be classed as reputable practitioners. The majority, however, are a sorry lot; advertising is rife, and the objectionable show-case, with the usual poorly executed specimens, is but too prominent at the street corners. With regard to the education of the medical specialist, the State has appointed Dr. Arkovy and Dr. Iszlai as docents, which term may be best defined perhaps as extra mural professors of dental surgery. Dr. Iszlai lectures on general odontology and dentistry once a week, on Sunday afternoons, from 3 to 4, and is justly

proud of his fine collection of odontological specimens, to which he has devoted much of his time and means. The Public Dental Institute is under the sole responsible management of Dr. Arkovy, in which he is ably assisted by Dr. Kozma, one of his former pupils. This institution owes its origin entirely to the zealous efforts of Dr. Arkovy, who may well be proud of having founded the first real dental school and clinic in the dual-kingdom of Austro-Hungary. The accommodation, adequate enough at the start, soon proved insufficient for the rapid increase of both students and patients; and the annual grant of 400 gulden (£32) was increased to 500 gulden (£40) by the Minister of Education—which can scarcely be considered a very generous subsidy. The apartments consists of a large room with three windows, and two smaller rooms with one window. The back part of the middle room is utilised as a waiting room, while that of the extracting room is occupied by the “dry operating table” with four seats. There are five operating chairs of very plain and simple construction, with accompanying sets of instruments and a Morrison dental engine, though most of the best students provide their own equipment. As the Institute is open for clinical purposes three times a week, from 5 to 6.30 p.m., lamps with reflectors are provided at each chair for use in winter. Most of the pupils are medical students of three, four and five years’ standing, while the remainder consist of young doctors and *rigorosanten*, *i.e.*, students who have completed all their courses of studies and are preparing for the final examination. The rapid increase in the number of students from thirty in the year 1881-82 to 175, of whom 30 are fully educated medical men, in the year 1885-86, seems to indicate two facts, *viz.*:—(1) that the medical profession in Hungary is fully alive to the advisability of a knowledge of the general principles of modern dentistry as an essential in a complete medical and surgical education; and (2) that in this Institute they have an adequate opportunity of acquiring this knowledge. Surely, in this respect, the medical profession in this country may learn something from their Hungarian *confrères*. The dental departments of our medical institutions have not been developed as they might have been; and until they are more consonant in practice with the advances made in our special schools we, as a profession, must accept a share in that apathy of medical men as the result of our own shortcomings.

The Institute also contains a small but interesting museum. The comparative anatomy collection contains about 100 to 120 skulls, with various other specimens of educational value. The pathological collection consists mainly of plaster models, partly reproductions of specimens in the museum of the Odontological Society of Great Britain, and partly casts of cases occurring in the clinic or in private practice. It also includes a considerable collection of models of regulating cases, with specimens of the apparatus employed. About 250 cases are thus at disposal for teaching purposes. The histological collection consists of about 100 carefully prepared specimens.

I have omitted to note the fact of another collection, viz., a box containing the contributions which each patient is expected to make, and is fixed at 20 kreutzers (about 4d.). Each student pays a small fee to the university treasurer according to the number of hours' teaching in the course. The teaching is both theoretical and practical. The theoretical lectures used to be held once a week, and the practical operations and clinical demonstrations twice a week, from 5 p.m. to 6.30 p.m.; but now the latter take up three afternoons and the lectures are given on the alternate days. The subjects of the course include odontography, structure and development of the teeth and jaws, and anomalies; pathology, embracing the diseases of the hard tooth substances, of the pulp, of the periosteum, of the gum and of the jaws. The academic year is divided into two semesters, and the whole course is completed in each year, but special lectures on extraction are given at the beginning of each semester.

The system of practical teaching is carried out in the following way. As each new patient takes his position in the examining chair, the demonstrator, usually Dr. Arkovy himself, gets the history of the case, makes a careful examination of the present conditions, states his views as to the diagnosis and prognosis, and finally decides upon the therapeutic treatment to be adopted. A blackboard by the side of the chair is in continual use during the examinations, and on the walls are hung tables of Arkovy's classification of dental diseases in Hungarian and Latin. He insists upon the Latin terminology as the only one suitable to their purpose, besides having the advantage of international comprehension.

During the clinic, the more advanced students carry out the conservative treatment which extends over the whole area of

dentistry, all the usual filling materials being employed. Before the student is entrusted with a conservative operation on the mouth he has to show his competency to perform the usual operations at the "dry operating table." After the examination of the patients, a demonstration is given of the operations treated of in the previous theoretical lecture. If suitable cases do not present themselves, the demonstrator inspects, in company with the students, the patients operated on, making practical observations on the operation performed.

Finally, as a part of the teaching, scientific and practical questions for research are suggested to the more advanced students. This has resulted in the publication of several papers in the Hungarian medical weekly journal and in the Austro-Hungarian dental journal, while some of them have been deemed worthy of translation and publication in our own journals. No provision is made for teaching mechanical dentistry. Although the institute is subsidised by the State, the amount is altogether insufficient, consequently the accommodation is not commensurate with the number of students and patients frequenting the clinic. The magnitude and importance of the work which Dr. Arkovy has achieved by his unflagging energy and perseverance is simply astonishing, especially when we remember that the course of dental instruction which the medical student undergoes in this institute is purely voluntary, and that some nine-tenths, if not more, of all the medical students not only pay an extra fee, but give up considerable time to attend the course. Only a holiday course was going on during the time of my visit, but I had an opportunity of seeing several operations well performed by the pupils.

The work of the institute is one of no light order, as may be gathered from the annual report, which also gives one a fair idea of Dr. Arkovy's classification of dental diseases. I was extremely anxious to ascertain how far his students had acquired a knowledge of the system, but owing to the difficulties of language, I was only able to learn that Dr. Kozma, the present assistant in the clinic, is a complete master of the methods of diagnosis. On several occasions he successfully diagnosed the diseases of the pulp in the mouth, which were fully corroborated by the subsequent examination of the extracted teeth, after cleavage to lay bare the pulp. I was unfortunate, however, in not coming across any of the rarer forms in which it seems to me the diagnosis must be more difficult.

DISEASES OF DENTAL PERIOSTEUM.

1.—*Periodontitis acuta.*

1	Periodontitis acuta marginalis	1
2	"	"	apicalis	...	11
3	"	"	circumscripta consecutiva	...	4
4	"	"	diffusa	...	20
5	"	"	purulenta partialis	...	1
6	Abscessus apicalis	...	...	...	3
7	Phlegmone acuta septica osteo-peridental	...	...	...	2

42

2.—*Periodontitis chronica.*

1	Periodontitis chronica apicalis	...	...	...	14
2	"	"	diffusa	...	190
3	"	"	purulenta	...	3
4	"	"	granulomatosa	{ diffusa apicalis	6 2
5	Necrosis apicalis	...	...	...	25
6	Necrosis totalis	...	...	...	43
7	Caries alveolaris (seu osteo-periostitis alveolo-dentalis [Magitôt])	...	...	{ partialis totalis	6 1

290

Total number of diseases of Dental Periosteum 332

DISEASES OF JAWS.

1	Abscessus alveolaris circumscriptus	...	...	14
2	Adeno-phlegmone submaxillaris	...	...	1
3	Abscessus processus alveolaris diffusus	...	...	4
4	Periostitis alveolaris chron. diffusa	...	...	6
5	„ „ „ circumscripta	...	...	16
6	Abscessus alveolaris chronicus (seu intra-alveolaris)	...	...	33

74

RARER FORMS OF DISEASES.

Abscessus retromassetericus	...	...	...	1
Abscessus subcanteus faciei	...	...	...	1
Fractura coronae	...	...	...	6
Inflammati papillae interdentalis	...	...	...	2
Inflammati glandulae submaxillaris	...	...	...	1
Inflammati mucosal oris	...	...	...	1

Carried forward ... 12

Brought forward	...	...	12
Gingivitis marginalis	...	...	4
Gingivitis hypertrophica	...	...	1
Gingivitis ulcerosa acuta	...	...	3
Leukoplakia buccalis et lab. inf.	...	...	1
Cicatrix labii infer. (post noma)	...	...	3
Asperitas coronæ	...	...	8
Anomalies of Teeth	...	...	10
Necrosis septi inter-radicularis	...	...	2
Anomalia eruptionis dentis sapientiæ	...	...	2
Necrosis eboris	...	...	1
Necrosis exanthematica	...	...	3
Defectus palati duri	...	...	2
Reflex. neuralgia nerv. trigemini r. I.	...	...	1
Adenitis simplex submaxillaris	...	...	4
Dolor post extractionem	...	...	2
Polypus gingivæ	...	...	1
Papilloma gingivæ	...	...	1
Hypertrophia papillae interdentalis	...	...	1
Ulcus labii et mucosæ oris	...	...	1
Cysto-sarcoma max. infer.	...	...	1
Atrophia alveolaris senilis	...	...	2
Hæmorrhagia post extractionem	...	..	1

 67

NUMBER OF OPERATIONS.

Extractions: Adults, 739; temporary teeth, 143...	...	879
Conservative operations	...	583
"Bloody operations" and treatment of wounds	...	25
Consultations	...	242
Removal of salivary calculus	...	35
Necrotomia	...	3
Oncotomia	...	10
Exstirpatio (Cicatrix, Polypus, Papilloma)	...	3
Cleft palate case	...	1
Splint to prevent contraction from cicatrization	...	1

 1782

It must be mentioned that the institution is in activity only

three times a week, viz: Tuesday, Thursday and Saturday, from 5 till 6.30 p.m.; and that there are only five operation-chairs at disposal. However each chair is well furnished with all necessary instruments, &c.

EXCISION OF THE CONDYLE OF THE LOWER JAW FOR THE RELIEF OF MECHANICAL TRISMUS.

Being the subject of a Clinical Lecture delivered at Westminster Hospital, and reported in "The Lancet."

By RICHARD DAVY, M.B., F.R.S.E., Surgeon to the Westminster Hospital.

GENTLEMEN.—In 1878 I read a paper before the Association of Surgeons practising Dental Surgery on the subject of excision of the condyle of the lower jaw for trismus. I have now operated on three cases; so will relate briefly the three histories, and then point out why this operation has been performed, and with what results.

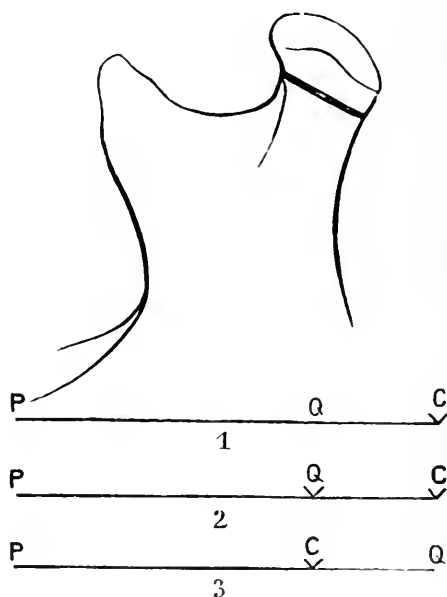
CASE 1.—Sarah C——, aged 50, married, was admitted into Westminster Hospital on October 23rd, 1878, suffering from inability to open her lower jaw by reason of fixity of the temporo-maxillary joint on the left side. In June, 1877, she was much exposed to cold, and for toothache had her left first molar extracted. In August an abscess formed, causing great deformity of her left cheek. In September the abscess burst into her mouth of its own accord, and nearly half-a-pint of fetid pus was discharged. The abscess cavity slowly healed, but she noticed an increasing difficulty in opening her mouth wide, some thickness of speech, and an occasional spasm of the left angle of the mouth. The trismus has steadily got worse. The patient has been married for twelve years without having been pregnant. She has been treated in St. Thomas's Hospital by a 2-lb. sandbag hung on to her lower jaw, but without any good result. On admission her speech was thick, and she could only pass a pin between her front teeth. The left temporo-maxillary joint was partially fixed; the right was more free. There was no facial deformity, no buccal scar, and no paralysis, but an occasional twitch of the left angle of the mouth. Sensibility was perfect; and she could forcibly contract both masseteric groups of muscles. She ate in a most inconvenient

manner, being unable to masticate her food ; she was compelled to push small morsels over the molar gums and then swallow them. There was no marked loss of flesh. No clear history of syphilis was given, but she has a small round tubercle by the parting of the frontal hair, and a diffused lump above the left olecranon. The diagnosis was fixity of the left temporo-maxillary joint by reason of condensed tissue around the pterygo-maxillary structures (left), and her twitch was explained by reflex action on the buccal branches of the fifth nerve. On October 28th, 1873, having placed her under the influence of chloroform, by means of a screw and lever I failed to produce any increased motion of her lower jaw laterally or longitudinally. I therefore, on November 5th, excised the left condyle of the lower jaw by an incision cut at right angles to the axis of its neck, nipped the neck across, and removed the condyle with the aid of a pointed lion forceps. Thus the inter-articular fibro-cartilage was left, and no injury done to the internal maxillary artery. There was trifling hæmorrhage ; three of my fingers could be admitted simultaneously into the mouth, and she could protrude her tongue between her teeth on awakening. A small sponge was inserted into the wound ; this was removed on the following day, and one silver stitch was applied as a compressing agent. She takes sop, and is much pleased at her regaining power of eating with comfort. On November 20th the wound had healed ; she could speak plainly, and had masticated a quarter of a pound of mutton, after abstaining from solid flesh for eighteen months. On December 8th, she was busily assisting her fellow-patients to clear away the breakfast things, when suddenly blood flowed from her mouth, and she dropped down dead. The post-mortem showed a large and unsuspected aneurysm of the aorta, which had burst into the œsophagus. I have the skull and lower jaw on the table ; and by the side of the lower jaw the condyle and neck removed by the operation I have described.

CASE 2.—Jane J——, aged nine, was admitted into Percy Ward on February 4th, 1879, for mechanical trismus, arising from asymmetrical development of the facial bones following scarlet fever. I removed the left condyle of her jaw on February 18th, with the immediate result of being able to open her mouth and insert my fingers. She continued to make good progress, the scar dwindling down to a slight straight line ; and she was discharged from hospital on April 16th. She is growing up an interesting,

though somewhat timid girl, with marked improvement in her power of speech and increasing facility of mastication.

CASE 3.—H. P——, age forty-seven, clerk, was admitted into Mark Ward on May 9th, 1885, the subject of left trismus. About 1880 he suffered from toothache on the left side, and his teeth have never been very good. There was no history of syphilis. Fourteen months before admission his lower jaw became fixed; he could open his mouth wide enough to admit a silver fork, but no food on it. He applied for relief at Guy's Hospital and remained in for two months, but did not improve. He was recommended to come to Westminster Hospital by his employers. On admission his case was clearly one of unilateral trismus, and seemed to depend on some fixity below the zygoma and around the anterior aspect of the coronoid process of the lower jaw.



Physical examination of the mouth was impossible. His breath was fetid, teeth numerous, and speech thick. He had lost flesh. As he had submitted to a most varied surgical discipline without any good result, I proposed excision of the condyle of the jaw on the left side. He readily consented, and as a preparatory measure I had his face shaved. Great was his surprise (for he had not been shaven for sixteen years) to find immediately beneath his left malar bone a deep depressed cicatrix, of which previously he had no cognisance. On May 12th the operation was performed in the usual manner, and the condyle and part of the neck removed, also the attachment of the pterygoideus externus muscle. No

difficulty was experienced, and there was no bleeding. The immediate result was that the mouth could be opened, and three fingers inserted. He was ordered as a gargle four drachms of chlorate of potass and three drachms of compound tincture of lavender, in a pint of water; and as a tonic, twenty minims of tincture of perchloride of iron, in water, three times a day. The man made an uninterrupted recovery, and left the hospital on May 30th, well able to eat and speak. The cicatrix is now being hidden by regrowth of his whiskers. On July 31st, the patient was able to report good progress, the interval between the teeth being at the widest point three-quarters of an inch. On August 17th, 1886, I carefully examined him. When he opened his mouth there was found to be three-quarters of an inch between the incisors. He was free from annoyance. There was no fetor of breath, and no thickness of speech. The cicatrix was completely hidden by whiskers, and so also was the submalar one, about which we know nothing. He was able to eat half a pound of mutton for dinner, was gaining flesh, and had his old sense of well-being.

Why the operation has been performed.—A very few words will explain how miserable is the condition of a patient unable to eat or speak with comfort; how troublesome it is to suffer from oral and dental fetor; how alarming to watch the gradual loss of flesh and healthful vivacity. Patients will direct the surgeon as to which of the two hinges of the jaw is at fault, and in all cases make a careful and minute examination of the facial skin and buccal mucous membrane. By the aid of this diagram (see engraving, *ante*) you will notice the line marking the spot for the excision of the condyle and neck of the jaw, and also the three succeeding lines showing the varying conditions of jaw leverage. In each instance, for the act of opening the jaw, let *c* be the fulcrum, *p* the power, and *q* the weight. No. 1, the position of power and weight in any normal jaw. No. 2 (lever of the second order), the position of two fulcra in these conditions of unilateral trismus. No. 3, the position of power and weight, after the operation of removal of the condyle; or, in other language, the conversion of a normal mechanism of the jaw (lever of the second order) into that of an operated case (lever of the first order). Compare Nos. 1 and 3. And now look at No. 2, which, in my opinion, explains the secret of many of these unilateral trismus cases, and also at this rough model I have cut out of wood, show-

ing the condyle of the jaw, the mouth, and the temporo-malar coronoid structures. From dental irritation, or an old abscess, or other accident, a local definite adhesion results between the coronoid process and zygomatic fossa; or between or around the plane of the pterygo-maxillary ligament, fixing the lower to the upper jaw at any point between the teeth anteriorly and the temporo-maxillary joint posteriorly. It is obvious that any attempt to depress the symphysis is negatived by the new material (disease) acting as a fulcrum (instead of a movable mass); and as the condyle naturally is the fulcrum, there are two fulcra, and until one is knocked away (the condyle) no opening of the mouth can take place.

With what results this operation has been attended.—Professor Humphry's case (in 1855) of excision of the right condyle of the lower jaw for chronic rheumatic arthritis was successful; and in a letter sent to me in November, 1878, the Professor says: "The patient was well and able to masticate comfortably some years afterwards; the operation answered the purpose well." My three cases have also mechanically succeeded. Two are alive and well; the first died of syphilitic aneurysm of the aorta immediately after enjoying a good breakfast. I show you also to-day a specimen of chronic rheumatic arthritis of the temporo-maxillary joint (left side). This specimen came from our class subject in operative surgery (session 1884); for accidentally one of my pupils, in operating for the excision of the condyle of the inferior maxilla (an operation then taught by me as a recognised operation) came across genuine disease, and secured this not common preparation. We have on the table specimens of case 1, superior and inferior maxillæ, condyle, and resultant cicatrix; Case 2, left condyle removed; Case 3, left condyle removed; operative specimen of arthritis of the temporo-maxillary joint. Strangely enough, all my preparations are left side specimens.

One word on the *method of operating*. Take the tragus of the ear as your guide, and make a horizontal incision (not more than an inch) across and down to the neck of the jaw, so as to allow strong cutting forceps to embrace the neck; divide the neck and evulse the condyle. This act of turning out the head of the bone may be done by the bone nippers or pointed strong bone forceps. I am tempted, while on this point of turning out heads of bone, to draw your attention to a valuable plan of impacting a strong steel lever

into the cylindrical substance of the bone itself; this impaction not only gives a useful leverage in turning out small pieces of bone in cramped corners, but also allows the free play of the knife around and close to the bone, without the blades of any bone forceps coming in the way of sight or blunting the edge of the knife on the blades of the forceps. The leaving of interarticular fibro-cartilage prevents any future bony union occurring. Coupling, then, these three cases of my own with Professor Humphry's case, I am inclined to recommend the operation of excision of the condyle of the jaw for mechanical trismus. Instead of misery and inanition, by recourse to an easy and not dangerous operation, the surgeon restores freedom of speech and reopens the gateway of alimentation; no large scar results, and in adult males this scar is hidden by hair. This operation affords another example of the warrantable sacrifice of perfectly healthy parts in one locality so as to effect the well-being and happiness of the whole body.

NOTES ON THE DECAY OF HUMAN TEETH.

By Professor W. D. MILLER, Berlin.

(*Reprinted from the "Independent Practitioner."*)

Four or five years have now elapsed since what may be called the chemico-parasitic theory of tooth decay came into prominence, and since that time it has been very steadily gaining ground. A very great obstacle in the way of its advancement has been the general lack of information as to the conditions of growth and physiological action of fungi, particularly those of the human mouth. It is, however, to be hoped that the work begun by the Illinois State Dental Society, under the leadership of Dr. Black, will be taken up by other societies, and soon bring about a better understanding upon this most important subject.

It is not my object in this paper to go over the ground which I have pretty thoroughly traversed in other papers, but rather to call attention to some isolated points in the etiology of decay, as well as to a few points where I have not been quite correctly interpreted.

While many of the views regarding dental decay which I laboured to establish two or three years ago are now accepted without reserve, and others have lately been completely confirmed

by Drs. Black, Sudduth and others, I am not aware that a single point has been made by anyone which could in any way impair the validity of the conclusions at which I then arrived.

ON THE PHYSIOLOGICAL ACTION OF FUNGI.

There seems to be not a little misunderstanding, even among those who have given more or less attention to the subject, as to the physiological or chemical action of the fungi of decay, and the opinion is prevalent that during the first stage (decalcification) one fungus is present, but during the second (solution of the softened matrix) another. Arkövy even goes so far as to assume a special organism for *Caries chronica*, another for *Caries acuta*, and a third for *Caries acutissima*, &c.

I have already clearly demonstrated in this journal, that any fungus of the human mouth, whether temporary or permanent, which can affect a fermentation of starch or sugar, may be instrumental in bringing about the first stage of decay; that any which possesses a peptonizing action may, by dissolving the softened dentine, produce the second stage; and that any which possesses both properties (and there are many such in the human mouth) may accomplish the whole process of decay. The micro-organism which produces the decalcification may also produce the solution of the decalcified substance.

I have also shown in these pages that the reaction produced by a given fungus depends, in many cases at least, upon the nature of the culture medium. For example, the comma bacillus which I found in the human mouth liquefies the boiled white of egg (it also liquefies decalcified dentine), with the development of strongly alkaline products and offensive odours; in beef-extract sugar solution the reaction is distinctly acid, with no trace of bad smelling products. The reaction of a solution containing a pure culture of a fungus can, in the majority of cases, be made neutral, alkaline or acid, at will, by varying the relative amounts of albuminous and saccharine substances present in the solution. In a like manner the reaction in a cavity of decay must depend to some, if we may not say to a great extent, upon the relative amounts of nitrogenous and non-nitrogenous materials in the cavity. This fact will explain an appearance frequently to be met with in the oral cavity. We find a tooth badly broken down, the pulp ulcerated or gangrenous, the gum, having grown into the

cavity and constantly irritated by the sharp edges of the tooth, likewise inflamed and suppurating. We have here an excess of nitrogenous material, and a putrid, alkaline condition. Instead of a thick layer of softened dentine, we find a thin, black, or dark brown layer of comparatively hard dentine, a condition which has led to the statement that decay of pulpless teeth is essentially different from that of normal teeth.

We need not go far for an explanation. The already softened dentine has been for the most part dissolved, and, owing to the *present* alkaline condition, no farther decalcification can take place. From this condition to one of rapidly advancing decalcification we find every transition.

DECAY OF BAKERS' TEETH.

One of the most convincing features in favor of the chemico-parasitic theory is its ability to account for the most diversified phenomena of decay. A striking proof of this is furnished by an article on the above subject from Prof. Dr. Hesse, in the *Deutsche Monatsschrift*.* Hesse finds that bakers suffer to a surprising extent from decay of teeth, affecting principally the labial surfaces. He attributes it to the fact that bakers constantly breathe in flour, which is deposited upon the surfaces of the teeth, where it speedily ferments, after being converted into sugar by the diastase of the saliva. I recorded in this journal an experiment in which a glass tube filled with flour and tied to a tooth in the mouth showed a strong acid reaction in a few hours. Hesse looks upon the rapid decay of bakers' teeth as a confirmation of the theory which I have supported.

CARIES UNDER FILLINGS.

In regard to this subject, I have not been quite correctly understood. All bacteria require moisture for their proliferation. The majority of them (the ærobes) require oxygen; a few (the anærobes) grow better without oxygen; some grow equally well with or without (here belong a number which I have met with in the mouth), while very many, if not all, may subsist for a short time on the oxygen contained in the medium in which they are found.

From these facts every one may draw his own conclusions. If softened dentine is left in a cavity it should, in every case, be

* A translation of this article will be found in the September number of the *Independent Practitioner*, page 527.

perfectly sterilized and dried (with warm air) before filling, and the filling must, of course, be water tight. Only under these conditions can we with certainty prevent the softened dentine from farther decay, since the mere exclusion of air is no guarantee against the action of the fungi.

LIME-SALTS AS ANTACIDS.

The lime-salts of the tooth are usually spoken of as antacid, and therefore as speedily neutralizing the acids of decay. This is only in part right. The carbonate of lime is antacid, but the phosphate, which makes up the great bulk of the lime-salts, is not, *i.e.*, it cannot neutralize the acids of decay. Add as much phosphate of lime to a weak solution of lactic acid as it will dissolve, or even an excess, and it will be found to be as strongly acid as before, and in this condition it still appears to retain the power of softening dentine, though not as rapidly as an equally strong solution to which no phosphate has been added.

A drop of lactic acid applied to dentine does not, therefore, extract that amount of lime-salt which is necessary to neutralize it, but rather that which is required to form a saturated solution of the phosphate after, of course, deducting the amount which has been neutralized by the carbonate. In another paper I will discuss this point more fully, and endeavour to present some interesting facts which grow out of it.

TEST FOR LACTIC ACID IN DECAYING DENTINE.

Prepare a mixture of carbolic acid and chloride of iron, as described in previous numbers of this journal (the color must not be too deep). Put about 3 c.c., say a large thimbleful, in a test-tube, and carefully add the softened dentine from a decaying tooth; let it stand from ten minutes to two hours in a dark place, and a yellow color will usually appear around the pieces of dentine, indicating lactic, citric, tartaric or malic acid, and in consideration of the fact that lactic acid fermentation has been proved to be constantly going on at certain points in most human mouths, furnishing pretty conclusive proof of the presence of the first mentioned acid in decaying dentine.

This is the same result which I arrived at by the very laborious and difficult process of treating large quantities of decayed dentine with sulphuric acid, extracting with ether and forming the zinc-

salt. The amount of acid present in a decaying tooth is not always sufficient to produce the reaction clearly.

PIN-HOLE CAVITIES AND "CARIES INTERNA."

In practice we not uncommonly meet with cases where a very small opening through the enamel is the only external indication of a very large cavity in the dentine, and even when the enamel is apparently not yet broken through, we may find, on cutting into it, a cavity already forming, or at least a considerable softening in the dentine, giving rise to what I think has often been mistaken for "caries interna." We frequently ask ourselves the question: Can the small particles of food which may enter through so minute an opening bring about so extensive a decalcification? Recent observations have rather inclined me to the view that it must, or at least may, be so.

In explanation of the first case, I have seen the same appearance exactly in pulpless teeth, and have produced it artificially. I have a second temporary molar which was exposed for seven months in a fermenting solution. It shows three pin-holes on the grinding surface, one of them extending nearly to the pulp and undermining the enamel in all directions. Here there was nothing present to produce the effect described, excepting the chemico-parasitic factors.

In explanation of the second case, I have observed that acids may work their way through enamel in sufficient quantity to produce a softening of the underlying dentine, without completely breaking down the enamel, or revealing a cavity to the naked eye or a blunt instrument.

I have specimens in which the dentine is infiltrated with micro-organisms and beginning to dissolve, while the enamel covering is still not completely disintegrated. In all cases of this nature interglobular spaces naturally play a very great role. In teeth of very inferior structures the dentine is, in some places, a mere framework, which is quickly softened, even by very weak acids. It must, furthermore, be borne in mind that in mastication food is subjected to considerable pressure, by which it may be forced through the smallest cracks or openings. We have all seen how particles of food may find their way to the very apex of a root canal which we have under treatment, if we allow it to remain open for a day.

(*To be continued.*)

CANCNUM ORIS.

At a meeting of the Cambridge Medical Society, held on October 8th, Mr. Wherry related a case of cancrum oris that was lately under his care in Addenbrooke's Hospital. A female domestic servant, aged twenty-five years, had a deep ulcer filled with yellow slough, occupying the whole of the inside of the left cheek, said to have begun as a gumboil. The ulcer was almost painless. The skin of the left cheek was dusky red in colour over the slough, was nearly destroyed, and eventually there was a perforation through the cheek. The separation of the slough was at no time accompanied by any hæmorrhage, there seemed to be no granulating surface to bleed, and there was only a thin watery discharge and faintly tinged saliva. Her complexion was remarkably pale-yellow and wax-like. The fever was high and the pulse rapid. The register on the chart was usually 104 degrees to 105 degrees, and the pulse 160 or more. She had been ailing four or five weeks, and had suffered from the ulcer two weeks before admission. No treatment was of any value in checking the progress of the malady, and she died exhausted in twelve days. She had always a good appetite, partook heartily of a liberal diet, and did not consider herself very ill. On two occasions operations were performed under ether. At first the slough was cleared out and the cavity left was swabbed freely with nitric acid. At a later stage the cheek was laid freely open from the outside. Quinine stopped the rigors which occurred occasionally. Iron was also given, and later on opium. Condyl's fluid and insufflation of iodoform were tried locally. This patient was always pale and perhaps anæmic, but she was not ill-fed or ill-nourished, nor was she recovering from any acute fever. She had been able to do her duty as a domestic servant until attacked by disease. Mr. Wherry mentioned the reasons for making a difference between cancrum oris and other conditions somewhat similar, as ulcerative stomatitis. It was not a case of acute necrosis of the upper jaw. Though as yet no organism had been isolated from the blood or tissues, nor had the disease been inoculated, it seemed probable that in the future, as in the case of anthrax, a definite micro-organism would be discovered in cancrum oris. Animals injected with the blood of patients suffering from cancrum oris died of septicæmia, usually with peritonitis.

BRITISH DENTAL ASSOCIATION.**CENTRAL COUNTIES BRANCH.**

THE annual meeting of this branch was held at the Dental Hospital, Birmingham, on October 8th—Mr. Frank Huxley, M.R.C.S., L.D.S.Edin., President, in the chair, It was decided to hold the next annual meeting at Shrewsbury, and Mr. W. E. Harding, L.D.S.Eng., was appointed President-elect. The President having retired from the chair, Mr. Brewer Neale, L.D.S.I., President for the current year, assumed office.

A paper on "Man's Lost Incisors," by Professor Windle and Mr. John Humphreys, was read by Professor Windle. The conclusions of the authors were: (1) That man's original dentition was $\frac{2}{3}$ incisors. It has long been an accepted fact that some ancestral relative of mankind possessed this formula, but it is a bold statement to assume that it was ever possessed by any creature that could be designated "man," and if this is the Professor's contention, we do not think he will find it easy to substantiate. (2) That two incisors from each jaw have disappeared; this is of course obvious if man ever possessed six. (3) That this loss is due to a contraction of the palate. (4) That the process of contraction is still in progress, and will probably proceed until two more incisors are lost; both of which statements, although by no means novel, are still altogether hypothetical. And (5) that the conical shape of many supernumerary teeth indicate a reversion to a primitive type.

Mr. Chas. Sims had prepared a paper on "The First Permanent Molars," but time only allowed of an abstract of the paper being read, and the discussion upon it was deferred to the next ordinary meeting.

There were shown several interesting cases of restoration of lost portions of the jaws, and demonstrations were given by Mr. S. Birt and Mr. J. Humphreys.

In the evening the members dined together at the Clef Club, Mr. Brewer Neale presiding.

MANCHESTER ODONTOLOGICAL SOCIETY.

THE first meeting of the second session of the above Society was held on the 5th October, at the Grand Hotel, Aytoun Street, when the President, Dr. Parsons Shaw, delivered his inaugural

address, in which he treated of the necessity of a practical education for the dentist, and the supreme importance of local dental societies, where, by the discussion of professional matters and intercommunication of ideas, this education can be carried on throughout a lifetime.

The officers of the Society for the current year are :—President, Dr. Parsons Shaw ; Vice-Presidents, Messrs. P. Headridge and L. Dreschfeld ; Councillors, Dr. P. Betts, Messrs. H. Campion, W. Dougan, W. Dykes, J. H. Molloy and G. W. Smith ; Treasurer, Mr. H. Planck ; and Hon. Sec., Mr. George G. Campion.

JOURNALISTIC SUMMARY.

THE DENTAL COSMOS (*October, PHILADELPHIA*)

"SOMETHING ABOUT REGULATING AND REGULATING APPLIANCES," by Garrett Newkirk, M.D. When teeth are to be moved the difficulty often presents to get a base resistance broad enough and strong enough to bear the strain of necessary force without being itself moved. In other words, the body to be moved has greater resistance than the base or fulcrum on which we have placed our dependence. This applies to the treatment of all malpositions of a one-sided character involving one, two, or several teeth. When the deformity is double and nearly equal, as it often is, we make each the basal point for the movement of the other. This we usually speak of as "spreading the arch," and much skill is sometimes demanded to make the resistances equalize.

When movement is desirable at one point only, we strengthen the basal resistance by extension. Herein is the advantage of a plate, which enables us to distribute force over such an extent of surface that only a small proportion is felt at any one point.

"THERAPEUTICS OF FUNCTION," by V. E. Turner, D.D.S., Raleigh, North Carolina. A paper read before the North Carolina State Dental Association, at the meeting in Raleigh, June 1st, 1886.

There is one law in nature to which there seems to be no exception, and that is that each organ must be exercised in order to have a healthful development and to maintain a healthy existence.

A most forcible illustration of this principle is shown in the case of a cow living in the meadows, where she crops the grass with a dental organization especially adapted for such a purpose. As long as she thus procures her food her health will be good and her teeth will not give out. But place her in confined limits, and feed her on swill, which requires no mastication, and in the course of a few years, if you will examine her teeth, you will find that decay has set in ; that she has inflamed gums and periostitis, and if forced to continue this mode of life her milk will be unfit for use. Another example bearing upon this point is shown in the pet dogs in large cities which are fed upon cooked food requiring but little mastication. They are often troubled with sensitive and decayed teeth, which are unheard of in dogs which live upon raw meat and bones that require mastication. Why should human teeth be an exception to this law of development and health from use ? Is it not a fact that those people who have not attained this higher civilization show less of this deterioration of the teeth than we do ?

It is an acknowledged fact that tobacco-chewers have in the main better and stronger teeth than those who do not chew ; and as far as can be discovered the juice of the weed plays no important part in preserving them. The improved quality must be due to their increased activity. It is very often the case that, owing to the loss of some important grinders, or the discomfort arising from some sensitive places, persons contract the habit of chewing almost exclusively on one side of the mouth, and, when such has been the habit for any length of time, you will generally find the teeth on the side most used are in a more healthy condition than the others. All of these facts go to prove that function plays a most important part in the health of these organs.

Now, if it is true that people who live upon soft food, rich soups, &c., show in each succeeding generation that their teeth are becoming weaker and are an easier prey to disease and decay, and on the contrary those who live upon food requiring greater activity of the dental organs present no such deterioration, then we are forced to subscribe to the theory advanced.

The meeting of the American Dental Association, second day, is reported. Dr. Herbst was present, and a long discussion was held upon the rotary method of filling.

Dr. Bödecker spoke of a method of obtunding sensitive dentine which had been shown to him two years ago by Dr. Herbst, but of the safety of which he was for a time doubtful. The obtunding agent consists of chemically pure sulphuric acid saturated with hydrochlorate of cocaine; stir till the cocaine is well dissolved; then to this solution add sulphuric ether to the point of supersaturation, stirring with a glass rod,—not shaking it, as that might cause it to burst the vessel or force the cork out. A better way to make it is to use a long test-tube. (If the sulphuric acid becomes dark when the cocaine is added it shows that the cocaine is impure.) A little of the solution is then applied to the sensitive cavity, and the effect is beautiful. You cannot obtund the whole of the dentine at once—only a layer at a time, and when this is removed, another application of the obtundent is made. You can proceed with the excavation in two minutes after the application is made.

Dr. Taft said the composition and the effects of this obtundent seemed very peculiar, when he was first shown it by Dr. Herbst, and on his return home he had made a quantity. One drachm of sulphuric acid dissolved thirty grains of cocaine crystals. The quantity of sulphuric ether is immaterial, enough only being required to saturate the solution. He has used it almost daily, and in every instance it has been successful. Whether this unvarying success has been due to the properties of the material or to the character of the cases in which it has been used, he could not say. The method of its action probably is that the sulphuric acid dissolves a portion of the dentine; and the cocaine obtunds it during this process. The ether is for the same purpose, he apprehended.

Before the Southern Dental Association, Dr. B. H. Teague, read a paper on "PERSONAL HYGIENE," dealing with the light and ventilation of operating rooms, exercise, use of food, &c.

At the June meeting of the New York Odontological Society, a paper was contributed by W. H. Rollins, M.D., D.M.D., on "REGULAR EXAMINATION OF THE SALIVA." The reaction of the oral fluids must be kept alkaline. To accomplish this it is necessary to teach the patient to test his saliva at short intervals, and if it is acid or neutral he should take the remedies found best in his case. Sometimes it is only necessary for him to work or

study less and take a little more fresh air. In most of the cases local treatment will not do, constitutional remedies being required. To use these understandingly is often difficult, as it is hard to find out the particular cause of the trouble. While trying to do this we can treat the symptoms by giving alkalies, which are most efficient in the form of mineral waters. It would seem easy to test the saliva with a piece of litmus-paper, but, like every observation, it requires a little skill.

"THE DESTRUCTIVE ENERGY OF THE TINCTURE OF THE CHLORIDE OF IRON ON THE TEETH: AN EXPERIMENTAL STUDY," was the subject of a paper by George W. Weld, M.D., D.D.S. The questions which are most likely to interest the dentist are :

1. What preparation of iron is the best to prescribe, or shall be recommended most ?
2. In what degree of destructive energy do the acid and astringent properties of iron act on the teeth during the process of ingestion ?
3. What is the proper method of administration ?

THE INDEPENDENT PRACTITIONER. (*October, NEW YORK*).

"NOTES ON DECAY OF HUMAN TEETH," by Professor W. D. Miller, is reproduced at page 507 of the DENTAL RECORD.

"PROFESSIONAL COURTESIES IN CONNECTION WITH WHAT ARE COMMONLY CONSIDERED FAILURES IN DENTAL PRACTICE," by Dr. C. E. Francis. Unfortunate it is, that some individuals are too ready to pass unfavorable comment upon the works of others, especially if in the least degree faulty, without possessing sufficient generosity to credit them for achievements that are eminently successful, and that bear the stamp of excellence.

Sensible people, however, are not unlikely to distrust those who speak uncharitably of their compeers, and it frequently happens that ungenerous comments reflect unfavorably upon parties who utter them.

When dismissing our patients, we are not always sure that they will return to us for future treatment. In the course of time many will get into other hands. Some remove to distant localities, and find it inconvenient or impossible to come again. Others, by nature, are inclined to wander and are fond of making changes. Some change with a few to economy; others, perhaps, from lack of confidence or a fancied neglect. Some fail to return because

bills for former operations remain unpaid, and such parties are usually ready to misrepresent or malign those whom they have defrauded.

Many an excellent and faithful dentist has been declared the author of discreditable operations which he never performed. Many have been charged with having inserted fillings (with assertions that they soon after "fell out,") in cavities that had never experienced the touch of a dental instrument! The decay and destruction of entire dentures, resulting from sheer neglect and carelessness on the part of individuals who possess them, are often charged as malpractice on the part of some dentist who, perhaps, simply introduced a single filling, or removed beds of calculus and polished the stained surfaces of enamel.

The causes that tend to failures following dental operations are many, and when duly considered, it seems a wonder that there are not more of them. Very many individuals defer their visits to the dentist until driven by dire necessity to seek relief from pain, and it is then found that their teeth are in a sad plight; and yet it is often expected that such dilapidated and diseased organs can be so restored that they will promise even better than before they became so wretchedly neglected or abused.

Let us do justice to others as we would wish justice done to ourselves, and may we never forget that professional courtesies of every sort are much like "bread cast upon the waters," rewarding us with happy reflections, and inducing a reciprocation of kindly courtesies, with the hearty good will and esteem of our professional brothers.

"POPULAR APPRECIATION OF DENTISTRY," by L. C. Ingersoll, D.D.S., being a paper read before the Odontological Society of Western Pennsylvania.

The various pursuits in life are esteemed and appreciated for just what those who are engaged in them make them. *First* the man, *then* his calling. That which is most highly appreciated among men is mental endowments and culture. It is not so much what a man does, as the amount of brains he takes into his work. The man who puts the most brains into his work can command the highest appreciation expressed in fees. There are men of high education and culture in the dental profession, who employ their education and engage their minds and best thought outside of their profession. The callings of some men of excellent minds and

culture are such as to afford no scope for their study. They cannot put into their work the study and thought of which their minds are capable. They are compelled to go outside of their calling to find suitable employment for their minds. But this is not the case with dentistry and the dental profession.

It is the comprehensive view of dentistry that inspires a man to enthusiasm in the pursuit of his profession, and to become the progressive man whom the intelligent and progressive people of the town like to meet and to employ. It is not enough, then, that a man should be educated and learned, but that he should be known as employing that education and learning enthusiastically in the pursuit of his profession, and not outside of it.

A dentist must have a high appreciation of *dentistry*; not a high appreciation of *himself* expressed in arrogant conceit, but a high appreciation of the value of dental science worked out in a dental practice for mankind.

A dentist's patrons must be made to feel that he is truly honest in his dental operations—that he is not working simply to get a living—that he does not talk dentistry for the mere dollar's sake, but that in his dental skill and knowledge he holds a high trust for the benefit of his fellow men. All kinds of trickery, deceit, and covering up of conditions or results, should be as foreign to him as to sun-light. All that he says and does should have the openness of christian day-light. This perfect frankness and honesty creates in the mind of a patron confidence and trust, which is the only foundation upon which can be built a successful practice.

“GELATINE FORMING MICRO-ORGANISMS,” by Dr. G. V. Black. One micro-organism in which I have been most interested is a wonderfully fickle plant, so much so that I have had great difficulty to maintain continuous growth of it. It is often impossible to replant or transfer it after the lapse of twenty-four hours. It seems necessary to do this twice or three times daily to keep it going. A tube planted with a colony picked out of a gelatine plate becomes almost as white as milk within three hours, and within fifteen to twenty-four hours the entire contents of the tube (peptonized broth with 2 per cent. of sugar), is gelatinized so perfectly that upon inverting it there will, at most, only a drop of clear fluid appear. It seems to grow best at a temperature above 100 degrees F., and my observations thus far go to show that it is essentially the organism of *sordes in fevers*. The tubes have a faint

yellowish cast, and in case all the fluid is not solidified, that which remains is as clear as crystal, and markedly acid in reaction. In most persons whom I have examined, this coccus is found far back on the dorsum of the tongue, and occasionally I find it scattered generally through the mouth. It is a *Streptococcus* in form of growth, but rarely forms chains of more than five or six cocci. It does not grow in pairs, or even numbers, as the other streptococci, odd numbers being seen in the chain about as often as even numbers. Yet very many diplococcus forms appear from the division of single cells.

"TEETH WITH EXPOSED PULPS," by Garrett Newkirk, M.D. The writer criticises an article on the above named subject published in the July number of this journal.

At the Annual Meeting of the Southern Dental Association, Dr. Catching related a well authenticated case of tooth development. A child, born in 1871, began teething at the age of six months, erupting a full set of very small teeth, which were all shed within three months. At the age of eleven months she began teething again, and at the age of fifteen months had a second full set. These also soon crumbled away like chalk. When two years and a half old she weighed ten pounds, had a third set of teeth. Suffering much from them, they were all extracted before she was four years old, but at seven years of age she had four front teeth of the fourth set. These were mere shells, and were picked off the gum with the finger nails. She began cutting a fifth set of teeth at the age of eleven, which she still retains, being now fifteen years of age. She is now a stout, healthy girl, budding into young womanhood, and a patient of Dr. Catching.

"THE HERBST METHODS," is the subject of an editorial article in which it is said there is a great deal of good in the Herbst method. Probably no one who has ever visited us from abroad has produced so deep an impression upon professional minds, or has seen such immediate practical results flow from its teachings, as has Wilhelm Herbst. As we said in the August number, this is largely due to certain peculiar circumstances, and to the genuine enthusiasm, the unselfish devotion, as well as the undoubted genius of Herbst himself.

Had the ideas of Herbst been without any practical value, they could not have produced upon professional minds here so deep an

impression as they have. There is no question concerning their great utility, and in our mind there is little doubt that Dr. Herbst's visit will permanently modify American dental practice. Not that we are of the opinion that his ways will supersede ours, or that the rotary burnisher will displace the mallet. It would be nonsense to claim this. But the method of condensing gold is not all there is in Herbst's system. There are numberless little inventions and ideas which are peculiar to him, and which form a part of his gift to the dental profession. And a gift it is, for we should not forget that Herbst has never taken out a patent, nor sought in any way to control his devices.

The American dentist who did not witness an operation at the hands of Dr. Herbst has missed one of the opportunities of a lifetime. It is almost impossible to entirely comprehend his methods without witnessing them. He is original in all his ways, and his expedients are endless.

Our advice to every operator is, that he carefully experiment in the Herbst system. Not with the expectation of abandoning the mallet, or any other established system, but that he may have command of a method which presents very many advantages, and which is peculiarly adapted to exigencies which often arise; a method by which results that are often desirable can more easily and perfectly be secured than in any other way, the study of which will certainly tend to give broader views of the possibilities of operative practice, and a knowledge of which will make better operators in the old established way, and assist to a more thorough comprehension of the underlying principles of operative dentistry.

THE DENTAL ADVERTISER. (*October, BUFFALO.*)

"MUCH OR LITTLE WATER IN VULCANIZING?" by G. B. SNOW. A series of recent experiments, not yet fully completed, seems at this time to raise a serious doubt as to whether a piece of rubber vulcanized in steam and above water can be distinguished by its texture from another piece of the same rubber, properly vulcanized under water. The caution extended to "give a little longer time for vulcanizing," gives the clue to the superior qualities, if any there be, to the steam-vulcanized product. The mixture of air and steam, usually included in a "steam-tight" boiler, is not so good a conductor of heat as is pure steam. The flask will not be as hot by several degrees when resting in the steam-space as when

placed under water, and it is undeniably the fact that a low temperature and long time produces the best results in vulcanizing. Hence, if two flasks are placed in the same vulcanizer, one in the water and one in the steam-space, there will be quite a difference in the quality of the rubber vulcanized in them, both being subjected to the same time, and apparantly the same heat.

If three flasks where placed in the vulcanizer with "a few spoonfuls of water," the difference of temperature will be no less, but rather greater, if they were in an atmosphere of mixed air and steam. If precautions are taken to expel all the air, the temperature will be uniform throughout the vulcanizer, and the vulcanizing uniform in all the flasks. As vulcanizing is usually done, with more or less air included in the vulcanizer, the actual temperature of the water may be as much as twenty degrees higher than the indication of the thermometer, which only gives the temperature of the vulcanizer cover upon which it is fixed. This is shown by the fact that a steam-gauge and a thermometer, mounted upon the same vulcanizer, cannot be made to agree in their indications unless all air is expelled from the vulcanizer.

A very important factor in doing good vulcanizing, is an even temperature; any sudden variations are sure to be shown in the quality of the work. Spongy rubber is sometimes caused by a sudden fall in temperature and pressure. This is one of the principal reasons for the uniform excellence of the work done by the gas-regulator, as this device automatically keeps the temperature at the desired point when it has once been attained.

Superior results can be attained with any good vulcanizer by a low heat, say 300 degrees, the time being lengthened accordingly. The plate may be placed under water or in steam; but to secure any certainty that the thermometer will indicate the true temperature of the interior of the vulcanizer, all air must be expelled from it by blowing off steam when it is first forming. Then the rubber will not be over-heated, and all the work will be evenly done.

THE ARCHIVES OF DENTISTRY. (*October, ST. LOUIS.*)

"FRIENDLY WORDS FOR THE 'POOR MAN'S FRIEND,'" by G. L. Shepard, D.D.S. The writer enumerates the difficulties or hindrances in the way of amalgam as a popular filling material, and classifies those hindrances as follows :

1st. Those members of the profession who do not use it.

This I found did well in extracting and gave almost entire relief in sensitive cavities.

For excavating sensitive cavities I have tried all the different solutions, applying the rubber dam, drying and using the two per cent. to twenty per cent. muriate and five per cent. of oleoate with varying results, all failing to give that relief I had hoped for. Not feeling willing to dismiss an agent that had proven so efficient in other cases, I tried an application of the salts in a buccal cavity in an inferior first molar by placing folds of bibulous paper on both sides of the tooth. I dried the cavity with cotton pellets so as to remove the saliva from the cavity, then with a spoon-shaped instrument just large enough to enter the cavity, I took as much salts as the instrument would carry in the bowl, in quantity about $\frac{1}{30}$ of a grain; this I placed in the cavity with a dry pellet of cotton varnishing the outside surface of the cotton to exclude all moisture. I then filled another tooth consuming about twenty minutes, then returned to the sensitive cavity and prepared the same with but little pain to the patient. By the use of the cotton and varnish I secured two very essential points: first, to secure the cocaine against outside moisture, and secondly, all appearance either from sight or feeling to the patient that they are being treated is removed, thereby creating the belief in their minds that it was not difficult to remove the trouble, thereby securing the full effects of the cocaine. I have continued to use it in this way with the same results, varying the time of application to correspond with the solidity of the tooth to be operated upon, in several cases making two or more applications.

“PREVENTIVE DENTISTRY,” by W. N. Morrison, D.D.S. The writer deals with the food and hygienic aspects of the question.

DR. GEO. H. WINKLER thinks that water-power is not reliable everywhere, and electricity, while very delightful and efficient, is very troublesome to keep up. The best motor, after all, was a big strapping negro. He used one with his suspension engine. Occasionally, in very delicate operations, if he wanted complete control of the engine himself, he could easily dispense with his motor for a short time; but for general purposes the negro motor is unequalled.

Editorial.

THE "LANCET" AND THE DENTAL PROFESSION.

IN January last we drew attention to some errors relating to dentistry to which the *Lancet* gave expression, and also to the patronising tone of its observations upon the dental profession. It is satisfactory to observe how much more favourable the *Lancet* now is to dentistry and the dental profession. The notices have recently been more in keeping with advanced dental knowledge, and a warmer sympathy has also been extended to our specialty. Evidence of improvement in these directions is shown in the following annotation in the number for the 9th ult. :—

*"Relation of Medical Men to Dental Quackery :—*We have had a matter of professional etiquette referred to us lately. A medical man writes saying that he was called in upon two occasions to administer chloroform to patients by a man who practises dentistry, but who, he has since been informed, is not registered, and our correspondent wishes to know what course he should pursue in future. There can be only one possible answer. He should absolutely refuse to attend. To associate in any way with one who is liable to prosecution, should he ever call himself a dentist and yet practises, must bring discredit not only upon himself but upon the medical profession generally. We will go further and say that no medical man should allow his name to be connected in any way with dental quackery or advertisement. Dental specialists have for years worked hard, and with success, to raise their professional and social status, and they look to their parent—the medical profession—to help them by not encouraging irregular dental practitioners."

Our contemporary has never advocated the cause of specialties, and we are glad to receive this more fitting recognition of our specialty. The tendency of the age, the ever widening field and aggregation of knowledge, with increasing variety and complexity in manipulative skill, all lead to specialisation as necessary to proficiency in certain branches. Particularly is this so with dentistry. That special branch of

the Science and Art of Medicine has its limitations rather more than less defined, but generally understood; it has its State recognition and legislation; its minimum curriculum of education established and guarded by the General Medical Council; it also has its special qualification, L.D.S., granted by the several surgical corporations of the United Kingdom. To any longer run counter with these facts and with a well established and recognised necessity for the present practice of dentistry would indicate an inefficient realisation of the situation. Therefore, our contemporary is to be commended on now being better advised and on the greater attention that is given to matters relating to dentistry. At the same time, also, the dental profession is to be congratulated on the more liberal sympathy which has recently been accorded by so important and powerful a journal as the *Lancet* undoubtedly is.

GOSSIP.

WILLIAM BROOKES, F.R.S., as President of the Chemical Science Section of the British Association, said:—"It is important to keep before men's minds the idea of the genesis of the elements; this gives some form to our conceptions, and accustoms the mind to look for some physical production of atoms. It is still more important, too, to keep in view the great probability that there exist in Nature laboratories where atoms are formed, and laboratories where atoms cease to be. We are on the track and are not daunted, and fain would we enter the mysterious region which ignorance tickets 'Unknown.' It is for us to strive to unravel the secret composition even of the so-called elements—to undauntedly persevere—and 'still bear up right onward.' We cannot, indeed, venture to assert positively that our so-called elements have been evolved from one primordial matter; but we may contend that the balance of evidence, I think, fairly weighs in favour of this speculation."

THE ocean is a great equaliser of extremes of temperature. It does this by its great capacity for heat and by its cooling and heating power when passing from the solid into the liquid and gaseous states, and the reverse. Sir J. W. Dawson, President of the British Association, further says:—"It also acts by its mobility,

its currents serving to convey heat to great distances, or to cool the air by the movement of cold, icy waters. The land, on the other hand, cools or warms rapidly, and can transmit its influence to a distance only by the winds, and the influence so transmitted is rather in the nature of a disturbing than of an equalising cause. It follows that any change in the distribution of land and water must affect climate, more especially if it changes the character or course of the ocean currents."

FURTHERMORE, the same authority observes:—"The Bermudas, altogether recent islands, have been stocked by the agency chiefly of the ocean currents and of birds, with nearly 150 species of continental plants, and the facts collected by Hemsley as to the present facilities of transmission, along with the evidence afforded by older oceanic islands which have been receiving animal and vegetable colonists for longer periods, go far to show that, time being given, the sea actually affords facilities for the migrations of the inhabitants of the land, greater than those of continuous continents."

IN the Perth Sheriff Criminal Court, on the 22nd ult., a complaint was called at the instance of the Procurator-Fiscal against James M'Guire residing in King Street, Perth. The libel set forth that he had contravened the provisions of the Medical Act, by having in September last, in his house and at various places throughout the town, represented himself as a doctor in medicine and surgery, implying that he was registered under that Act and recognised by law as a surgeon and practitioner in medicine. Accused failed to appear, and a warrant was granted for his apprehension.

PROFESSOR H. SIDGWICK, in his new book on "Outlines of the History of Ethics for English Readers," says:—"The subject of ethics, most comprehensively understood, includes (1) an investigation of the constituents and conditions of the good or well-being of men considered individually, which chiefly takes the form of an examination into the general nature and particular species of (a) virtue or (b) pleasure, and the chief means of realising these ends; (2) an investigation of the principles and most important details of duty or the moral law (so far as this is distinguished from virtue); (3) some inquiry into the nature and origin of the

faculty by which duty is recognised, and, more generally, into the part taken by intellect in human action, and its relation to various kinds of desire and aversion; (4) some examination of the question of human free will. It is connected with theology, in so far as a universal good is recognised, inclusive of human good, or analogous to it; and again, so far as morality is regarded as a code of divine appointment. It is connected with politics, so far as the well-being of any individual man is bound up with the well-being of his society; and again with jurisprudence (or politics), so far as morality is identified with natural law. Finally, almost every branch of ethical discussion belongs, at least in part, to psychology; and the inquiries into the origin of any moral faculty and the freedom of the will are purely psychological.

THE authorities of the National Dental Hospital and College have decided to admit to the advantages of the school ladies who are registered as medical students. It is understood that several applications have already been made by female medical students.

THE Annual Dinner of the Past and Present Students of the National Dental College will be held at the Holborn Restaurant, on Friday, December 3rd, the Dean in the chair.

The Medical and Professional Review, is the title given to a new Monthly Epitome of Medicine, Surgery, Dentistry, Veterinary Practice and Pharmacy; a Record of Scientific, Literary, and Biographical small-talk. It is published at 27, Margaret Street, Cavendish Square, W.

QUARTERLY STATEMENT of operations performed at the two Dental Hospitals in London and two Provincial Dental Hospitals, from July 1st to September 30th, 1886:—

Number of Patients attended...				London.	National.	Birmingham.	Manchester.
				7,468	6,230	3,354	2,707
Extractions	Children under 14			1,317	1,303	2,946	2,231
	Adults ...			3,434	2,076		
	Under Nitrous Oxide			1,783	1,662		
Gold Stoppings...				601	160	5	79
Other Stoppings				1,719	1,584	233	202
Advice and Scaling				463	781	284	—
Irregularities of the Teeth				221	543	13	—
Miscellaneous ...				1,021	453	206	759
Total ...				10,559	8,562	3,769	3,380

THE DENTAL RECORD.

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No. 12.

THE ELECTRO-MAGNETIC MALLET: ITS CONSTRUCTION, PHYSICS, AND ITS USE.

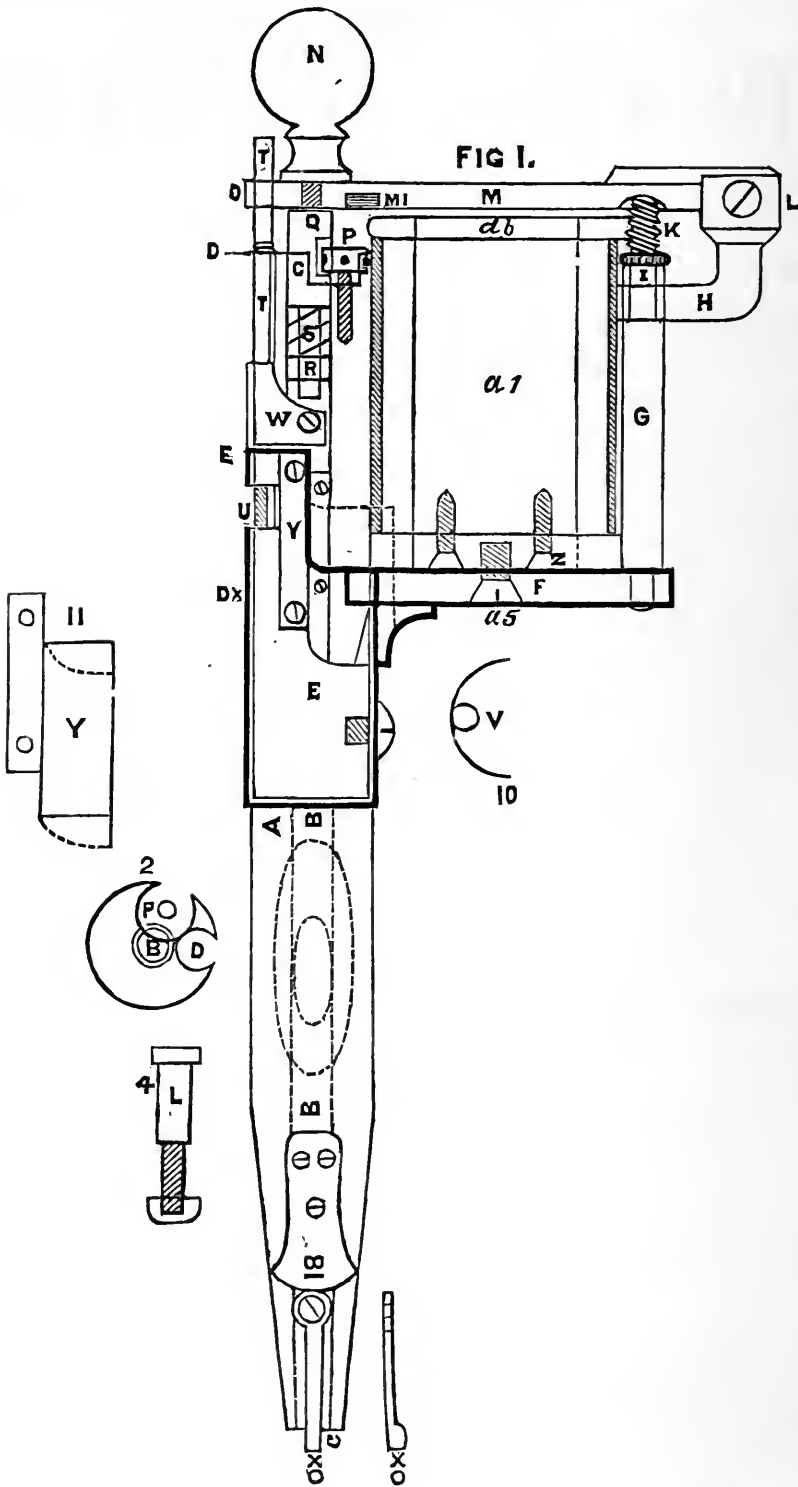
By THOMAS ROWNEY, L.D.S.Eng.

AMONG all the mallets which have been produced for making stoppings with gold, the Electro-Magnetic Mallet is pre-eminently the best. For rapidity of action, and the nicety with which the force of its blows can be regulated it has no compeer. The genius which gave it to the world deserves the thanks of every gold stopper.

It was after reading Dr. Marshall Webb's description of this instrument and its capabilities, that I determined to construct one, and the leisure hours of a winter's evenings were spent in working out its details. It was a task in the beginning, but it soon became a labour of love. As the work progressed, suggestions were made by brother practitioners who had used the Bonwill-Webb mallet, and had discovered some weak points in it—the results of over-elaboration. These suggestions led me to work on more simple lines, and the results have been so satisfactory, that I have used the mallet for nearly two years without having made a single alteration of importance.

A description of such an instrument as the Electric Mallet without drawings in detail would be of little service to any one. There are so many points for consideration and so many little niceties to be worked out, that without them the amateur is likely to lose heart before his work is half finished, and give up his job in disgust. It is with the hope that I may help the patient worker at the lathe that I have undertaken to lay down the lines upon which I worked in making two mallets, one of which I gave away, the other is my *vade mecum*, from which I hope not to be separated until some genius shall give to the profession a better

and more efficient instrument. The drawings give each part of full size, and the letters in every case refer to the same parts.



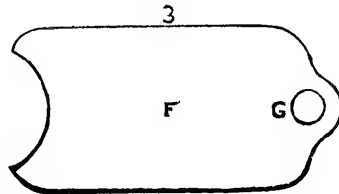
The metal parts are of brass, except where otherwise stated. The ebonite was made by the Scottish Vulcanite Co., and can be obtained from any of their agents. German silver tubing and

hard brass, of any size, can be purchased of Stanton Brothers, Shoe Lane, London. The brass castings were made from my own models, and the forgings were done by the village blacksmith.

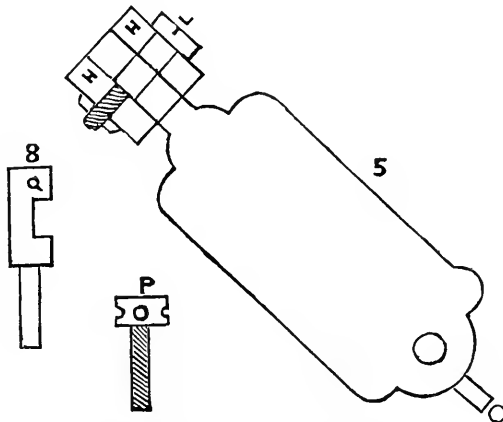
The handle A, Fig. 1, which carries all the other parts and in which the stopping instrument is placed, is made from a rod of ebonite half an inch in diameter and five inches long. One end of this rod should be fixed in a scroll chuck, the other end running easily in a boring collar of hard wood. It must be well lubricated. The central hole B must be bored with a twist drill and the loose poppet, using soap and water with a liberal hand. The drill should be frequently withdrawn, as the borings are likely to become softened from the excessive friction and so set the tool fast, risking the splitting of the ebonite. If this should occur it will necessitate a fresh piece.

A drill of the size required, long enough to bore the entire length, cannot be purchased, but one can be lengthened by cutting a thread on the shank and screwing it into a steel rod of the same gauge, setting it fast with soft solder.

The hole completed, a steel rod half an inch longer than the tube is to be fitted tightly. On this, with two centres, the ebonite



tube can be turned up with a slide rest to the drawing, taking care that it fits the tube E very nicely. This tube is of German silver,



and to it is attached with hard solder the piece F, Fig. 3, which is of yellow brass. After F has been attached, the tube E is to be cut away at the back part, as shown by the thickened line. G is

the pillar which is screwed into F. It carries at its upper end the forked arm H shown in plate in Fig. 5. Above it is a milled nut I, which serves to regulate the spiral spring K. M is the armature surmounted by the ball N, which gives additional weight and force to the blow; this works on the bolt L between the jaws of the fork, as shown in Fig. 5. The tongue O slides in the groove of the regulator T, and limits the length of stroke. P is a steel screw with a capstan head in which two holes are drilled through it at right angles. It is fitted into the recess P, as shown in Fig. 2, which must be drilled and tapped. To prepare this, a ring of metal should be fitted to the ebonite before drilling. This will prevent splitting. Q is the plunger. It is shown in Fig. 8, and is fitted to the hole B, in which it must move easily, but not too loosely. R is a ferrule of brass fitted tightly into B. Upon it rests the steel spring S, which serves to keep Q up to the head of P, which is enclosed in the notch. The regulator is shown in

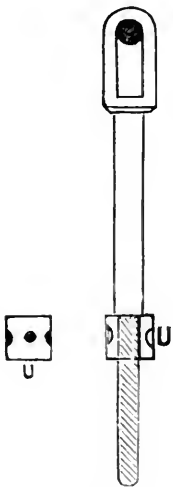
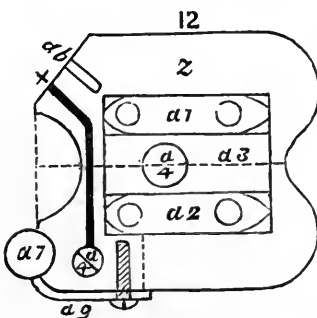


Fig. 9.

Fig. 9. The black portion is a piece of ebonite. Its use is to deaden the click of the hammer. This regulator is fitted to the groove D, Fig. 2, and is kept in place by the nut U, which in turn is kept in position in the square hole U in the tube E. It has four holes, as shown by the dots.

The cutting of the groove D, which extends from D to D \times , Fig. 1, can be done by ploughing or by drilling with the overhead motion in the absence of a planing machine. Within the upper part of the tube F are two rings, one of which is above the other, below the square opening U. They are shown in Fig. 10, V. These are guides to keep the lower part of T in position. W is a metal piece whose upper part presses on the flat surface of T to prevent its rotation. It is attached to the handle by two steel screws. Y, Fig. 11, is the guard whose use



will be explained hereafter. It may be made of thin brass, from a wax model, using a zinc die and lead counter. Z, Fig. 12, is of ebonite. The inscribed square must be *carefully cut out*, to receive the iron plate forming part of the core of the magnet.

The magnet is built up of two pieces of Lowmoor iron, the dimensions of which

are shown at *a1*, Fig. 1, and *a1*, and *a2*, Fig. 12. These are attached by screws to a third piece of the same thickness, as shown in the square enclosed in Fig. 12. The readiest way of holding these, while being drilled, is a block of wood about two inches square, upon the face of which is glued four other blocks, forming a box a trifle less in depth than the length of the pieces to be drilled. The screw AS, which is fitted to the third piece of the magnet, must not touch the coils of copper wire, or it will short circuit the current and considerably reduce the power of the magnet.

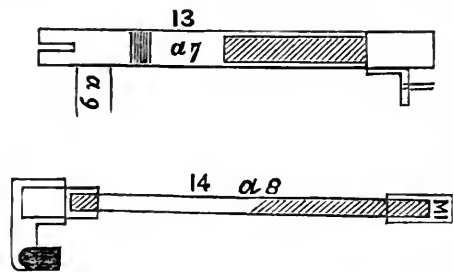
The angles of *a1* and *a2* are taken off to facilitate the winding of the wire, but they must be carefully preserved at the free ends to the thickness of a visiting card. They will serve to hold on the ebonite plates *ab*, whose shape is shown in Fig. 12, by the dotted lines. These are slipped on from the lower end, and must be flush with the upper surface of the iron. They are flanges to keep the coils in position during and after winding.

The wire is of copper, silk covered, No. 24, BW gauge. Two ounces is about the quantity required. It must be closely and evenly coiled on each arm separately, using the cross piece as a holder. This can be detached when the winding of the one is completed, and the process repeated with the second.

To ensure perfect insulation, the pieces of iron must be covered with goldbeater's skin before the winding is commenced, and a piece of the same material should be placed over each layer of wire. Of these there will be three on each limb, in one length of wire commencing at the lower end of the core, and terminating close under the ebonite flanges above. The ends of each helix should be left free about three inches, for making the connexions. When the limbs have been fastened to the cross piece, the upper ends of the wire must be joined by twisting, taking care that there is perfect metallic contact. This is best done at that part which is to be placed next the handle. Two pieces of Morocco leather attached with bookbinder's paste form a nice cover for the coils, and complete the magnet.

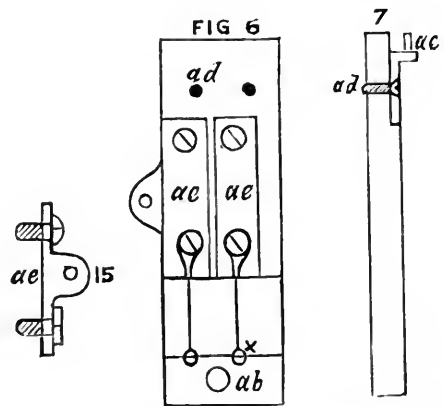
Next in importance is the contact breaker, Figs. 13 and 14. The tube *a7* must be triple mandre drawn or bored out in the lathe. It is cut away at the shaded portion so that the nuts which regulate the pressure of the spring can be easily got at for adjustment. There are two of these; they must slide easily in the

tube, so also must the spring which is fitted loosely on the stem *a8*, Fig. 14. *a7* is a ferrule fastened in the tube by two or three pricks with a fine punch; through this slides the stem *a8*, the lower end of the spring resting on it, while the upper end is pressed by the nuts; at the lower end of the tube is a slot, in which slide the feather on *a8*. The position of this slot will be determined subsequently. At *a7* is a piece of brass the width of *F*, which is hard soldered to the tube and bent to fit the ebonite piece to



which it is attached by a screw. At the upper end of the tube is soldered an Γ piece; it has a pin on its horizontal part, which passes through a corresponding hole in the upper flange *ab*. At *a7*, Fig. 12, the tube is seen in position. The feather on *a8*, Fig. 14, may be of dental alloy; the black portion is pure soft platina and is attached with 16-carat gold; the position of it must be such that it will fit fairly on the screw *a4*, Fig. 12, which passes through *Z* to the length of $\frac{1}{10}$ th of an inch. *M1*, Fig. 14, is ebonite, which should be turned truly and drilled in the lathe. It must fit tightly on the stem and have a small hole through its diameter to admit of its ready adjustment. Turning to Fig. 1, *M*, there is seen at *M1*, a square-bottomed depression which receives the *E* end of *a8*, Fig. 14.

Fig. 6 is of ebonite; it is attached to Fig. 12 on the flat *ab* by



a screw, and also to the flat on the upper flange *ad* by two pins,

one of which is shown in Fig. 7, *ac*. The metal piece which carries these pins is attached to the back of Fig. 6, as shown in the section. *ae ae* are of brass, as seen in section, Fig. 15. The two lower screws are of steel. Below them are two holes, whose position is a shade above the upper surface of Z. One of them corresponds with the channel shown as a dark line. A piece of copper wire, No. 24 gauge, is fitted into this, having a ring at one end, which is dropped into the countersink that receives the head of the platina screw *a4*, which holds it in position, with perfect contact. This wire is eventually to be brought through the hole \times Fig. 6, and attached to the steel screw above it. The springs O \times , Fig. 1, of which there are a pair, are of steel. They are shown in plan and section. The holes and channels in which they lie flush are cut with a flat countersink and a warding file. The bulbous end of the springs should fit the neck of the stopping instrument and hold it close to the ebonite plunger Q. The finger rest 18 may be of metal or ebonite. Its position on the handle must be suited to the operator. To this end it may be made with a slot in it for easy adjustment. The dotted oval is a depression cut through to the inside of the cylinder B. It is on the opposite side of the handle to which the finger rest is attached. The thumb rests in it and prevents the rotation of the plugging instrument when desirable.

The handle may now be passed through tube E as far as D, and placing the nut U in position, the controller T is to be screwed into it far enough to bring the slot to the level of O, the magnet is then to be arranged on the foundation F and secured by the central screw. The end of the coil nearest Fig. 6 is to be passed through the second hole and carried up to the steel screw as shown in Fig. 6. The other end is to be brought out at the dotted line near the screw *ag*, Fig. 12, and passed between the ebonite and the metal arm, with which it is held in close contact by tightening up the screw, thus completing the circuit through the contact breaker when the platina pins are in contact. Next comes the attachment of the hammer M, then the piece W, and lastly the guard Y, and the instrument is completed.

The connection with the battery is made at the pieces *ae ae*, Fig. 6, by a spring carrier, attached to a double wire of copper covered with silk. If all the connections are perfect, the hammer will be strongly attracted and held in contact with considerable

force. The contact breaker must be regulated so as to interrupt the current just as the hammer is about to touch the magnet. To ensure this it is well to place a piece of stout writing paper between them, and holding the hammer in position, see that

strikes the ebonite head M₁ and separates the platina pins under the foundation plate F. If this has been achieved, the vibrations will be regular and continuous, and the fortunate possessor of the mallet may throw up his cap and shout a loud huzzah!

The science of the Electric Mallet would be incomplete without some mention of the physics upon which its construction is based. So intimately are they related that without the knowledge of the one the other could not have been accomplished. The beginning of the 19th century saw the dawn of electro-magnetism, when Romagnesi, of Trente, and afterwards Oersted, of Copenhagen, discovered independently that a magnet was diverted from its normal position by a current of electricity passing along a wire placed over it. Then came the discovery of Ampère, that the current itself possessed the same property as a magnet, and that under proper conditions an electrified wire would arrange itself along the magnetic meridian. This can be very prettily demonstrated by a coil of half-a-dozen turns of 18 or 20-gauge copper wire, made on an ounce phial. After removing it, slightly separate the rings so that they do not touch in any part; to one of the ends solder a strip of copper $\frac{1}{2}$ an inch wide and $1\frac{1}{4}$ inches in length, and to the other end a strip of zinc the same size. Pass these through two parallel slits in a cork an inch or more in diameter and you have the beautiful floating battery of Delarive. Set it afloat in a glass of dilute sulphuric acid, 1 part to 12 of water, and it will so arrange itself that the face of the coil through which the current enters it will show as a south-seeking pole; if the same pole of a magnet be presented to it, the battery will float away, turn round, and present the other face, which will be attracted by the magnet. The further discovery of Sir Humphrey Davy and Arago showed, that when a piece of soft iron was introduced into a helix of wire through which a current of electricity was circulating it became powerfully magnetic, and that its magnetism lasted only so long as the current was flowing.

This was the nativity of the electro-magnet, upon which depends the action of the electro-magnetic mallet.

The researches of the physicist have shown that the power of such a magnet depends upon the strength of the current, and upon the number of turns of the wire which surround the coil up to a certain point—that is, the point of saturation, beyond which extra current and extra turns of wire do not develop greater force. From the foregoing the action of the mallet will be easily understood. The electric current flowing through the wire induces magnetic energy in the iron core, which attracts the hammer by inducing an opposite magnetism; this in its descent, when it is almost at its nearest approach to the magnet strikes the contact breaker which cuts off the current. The magnetism immediately ceases, and the hammer flies up to its original position through the action of the spring; the contact breaker does the same, the circuit is again completed, and like results follow. Suppose now, the contact breaker not to act and the platina points to remain in contact, the current will still circulate and the coil will become magnetic, the hammer will be attracted and held fast, and the coil will become sensibly warm to the hand, because platina offers seven times the resistance of copper to the passage of the current. In this instance we see the same energy showing itself in two very different forms. What is the wondrous alchemy by which these transmutations are wrought we cannot tell.

“In nature’s book of infinite secrecy
We can a little read;”

but it does not help us enough to formulate an answer.

The instrument I have described differs from the American mallet in having neither finger ring nor the means of cutting off the current by relaxing the pressure on the finger rest. In practice I have found these adjuncts worse than useless; the one limits the action of the hand, while the other demands a degree of attention which had better be applied to the operation in progress. I do not stop here. I maintain that the value of the mallet can never be fully developed until they are both done away with and the hand is left free to grasp the instrument in any position, instead of working it as one holds a pen. Further, the form of battery has much to answer for in the same direction. To be most effective there must be a means of regulating the amount of current employed, as upon this amount the force of the blow depends. I have heard it objected that the mallet chops up the gold. It will do so if the full blow be used upon foil or any other form of

gold before some amount of compression has been effected, but suppose we modify the force of the blow until little more than hand pressure is employed, we meet the objection at once. This can be done most readily by the pedal arrangement for immersing the plates of the battery, than which no better can be desired. A frequent cause of failure in gold stopping is over-malleting, especially when the walls of the cavity consist of little more than enamel. We have only to remember the position of the enamel fibres to see that this must be the case, if heavy blows impinge upon it, when the operator is giving the greatest care that the metal shall be in perfect contact with the edges. It may not be seen at the time, but a few days will disclose fractures at the edges of a cavity, which have been commenced by malleting beyond the metal with too heavy blows. The preventative is hand pressure only or delicate blows from the mallet. These latter can never be obtained where a battery is employed whose plates are always immersed to their greatest depth.

I might write of the value of the mallet in interstitial cavities in the incisors and canines, but these are points which will readily suggest themselves to every intelligent operator who has worked with the instrument only a short time, and I hope the day is not far distant when we shall have a right-angled arrangement for the mallet which shall do for cavities in the lower teeth that which it does so well for those in the upper teeth.

Over-haste and using too large pieces of gold are sure to eventuate in failures. The best mallet going will not save the careless operator from disappointment. "*Chi va piano, va sano e va lontano* ;" in other words, "Slow and steady wins the race." This is the motto which the operator must ever keep before him if he would save himself anxious days and restless nights.

I would not have it thought that one has but to set up a mallet, on the terms forewritten, in order to become a good gold stopper. Science, says "the Poet at the Breakfast Table," is fine furniture for the upper storey if there is common sense on the ground floor, but if there be science in both, so much the worse for the patient.

An intimate acquaintance with the science of the mallet every operator ought to have, and he must be the better for it, but there must be common sense, to apprehend at a glance the requirements of the case, and to see how best to meet exigencies as they

arise ; and more than this, there must be that manipulative talent born in the fingers and thumbs, which no education can impart but which education and perseverance will develop more or less, according to the measure of the inherent quality.

A PROFESSIONAL HOLIDAY.

By GEORGE CUNNINGHAM, B.A.Cantab., D.M.D.Harv.

(Continued from page 502.)

THE most pleasant of visits must sooner or later come to a termination, no matter how charming our social surroundings, no matter how fascinating the place of our sojourn ; so 'early one morning I found myself enjoying a very matutinal breakfast of grapes (two large bunches cost 2d.) in the morning express from Buda-Pesth on my way to Vienna. The attraction of the charming companionship of an Hungarian officer, who was a perfect master of the English language, and my haste to be in time for the large Congress of the German Natural Science and Medical Association at Berlin, combined to frustrate my projected trip to the Austrian capital by the well-appointed steamers which ply on the Danube. Even in railway matters we may learn something from the Austro-Hungarian administration. Soon after starting on our journey, one of the most affable of guards, in the usual military-like uniform, comes down the passage running along one complete side of the carriage to ascertain the number of those passengers who desire to order breakfast. The necessary information is telegraphed on to the next station, and when the train next stops, thanks to an adhesive number on your carriage window, an elegant electro-plated stand containing two jugs, one of coffee and one of milk, a glass of iced water, a roll and butter, and whatever else you may have ordered, is brought to your compartment to be disposed of *en route*. To my mind there is no coffee like Viennese coffee, and the cost of my simple breakfast was 6d.

Vienna, as we all know, is a very charming city ; but, as we all do not know, it is a dreadfully quiet, not to say dull, place of an evening : nobody seems to be about after nine o'clock, and by ten the streets are deserted. One night, after dinner, we adjourned to the Volksgarten, where two bands were giving a concert ; it was

thronged with people when we entered, yet before the termination of the programme, executed by the famous Strauss Band, the majority of the people were gone, and by a quarter to ten we had the garden to ourselves.

Before going to Vienna I had heard that I would find there one of the most beautiful dental collections in the world; consequently, the necessary communications having been made, I found the present proprietor, Dr. Otto Zsigmondy, quite ready to display all its attractions. The collection was so extremely interesting that I spent nearly a day and a half going through it in detail. It is mainly the result of the long and patient application of Dr. Adolphe Zsigmondy, the father of the present owner, who died in 1880. He was altogether a very remarkable man; and had, perhaps, contributed more than any other single individual to the advancement of dentistry in Austria. Having graduated as Doctor of Medicine in 1840, and as Doctor of Surgery in 1843, he quickly rose in his profession; and became one of the principal surgeons in the General Hospital. It was not, however, until the year 1853 that he passed his examination as a dentist (*Zahnarzt*). He gradually became more and more interested in dentistry, and finally gave up his surgical practice entirely to devote himself to that of dentistry, mainly because of a long-standing trouble of the foot. In the year 1868 he was appointed *privat-docent*, or teacher of dentistry, in the University. The main portion of the present collection was exhibited at the Vienna Exhibition of 1873, where it formed one of the most interesting features of the general collection made in the name of the Austrian Ministry of Education. Surely it were well to contrast this method of conducting such matters to that in our own exhibitions, where dental displays, owing to the ignorance of the exhibit committee and the indifference of our dental societies, are the undisputed monopoly of the advertising dentist.

It is especially rich in specimens showing the development of human teeth and jaws, abnormalities of all kinds, cases of irregularity and results of treatment, and the pathological specimens include especially good preparations of exostosis and phosphor-necrosis. The most striking features of the collection seem to me to be the admirable system of arrangement and the artistic excellence of the plaster models; indeed the models struck me as being by a very long way the best I have ever seen; and the

reproductions of the bones of the head, often with both the crowns and the roots of the teeth exposed, in order to display their abnormal positions, are really wonderful. The material used in taking impressions was isinglass—at least so Dr. Otto Zsigmondy told me—but possibly he may have confounded that with gelatine, as the price of the material he showed me is much cheaper than that for which we can purchase isinglass in this country. The son is naturally very proud of his father's collection, and is doing all he can in his power to extend it, but the conditions for making collections are not so favourable now as they were in times gone by, when the laws were less strict as to the disposal of those dying in hospitals.

Dr. Zsigmondy then took me to see the collection of the Austrian Dental Society (*Verein österreichischer Zahnärzte*), which is kept in the professional house of the President, Dr. Steinberger (*Am Hof*, 13). This is the collection made celebrated by Wedl. It was begun by Carabelli, and continued by Heider and others. It consists of about sixty skulls, varying in age, from the seventh month fœtus to the young adult, a large collection of separate jaw bones; a small collection of the skulls, jaws and teeth of animals; and a very extensive collection of teeth, rich in classified abnormalities, a good collection of plaster models, mainly irregularities, and an interesting collection of old dental instruments. It was indeed very interesting to have an opportunity of examining the actual specimens which are so admirably illustrated in Wedl's "Atlas to the Pathology of the Teeth."

The general condition of the profession in Austria is very similar to that existing in Hungary: the majority of the distinguished men practising dentistry, and contributing to its literature, are fully qualified medical men; but the great bulk of the dental practitioners is made up very largely of the *Zahnarzt*, and still more largely of the *Zahntechniker*. The principal Dental Society was founded about a quarter of a century ago, consists of about forty ordinary members, and holds monthly meetings. Besides the collection above referred to, it has a library of some 260 books, besides journals, though we could not help remarking the absence of recent English text-books and journals. The qualification for ordinary membership reads somewhat peculiarly: "That the candidate must be a 'Medicinal-Person' of scientific aspirations and undoubted respectability, entitled to practise

dentistry in Austria." Another Society called the Vienna Dental Society was founded in February, 1884, under the presidency of Dr. Carl Taussig, and holds its meetings fortnightly. This Society seems founded for the purpose of promoting the interests of the Zahnärzte or ordinary dentists, in contradistinction to the "Medicinal-Personen" who form the other society.

The only provision made in the way of dental education at present consists in a series of courses on operative dentistry, given by docents in connection with the Medical School. Dr. Steinberger holds a course twice a week, for an hour, in his own house; while Dr. M. Scheff delivers a similar course, in his surgery, thrice a week. Dr. Julius Scheff has a class in Operative Dentistry three times a week, and one, twice a week, on teeth extraction, in a lecture room of the General Hospital. Two similar courses are held at the University of Prague, by Dr. Schmid and Dr. Bastyr, also at the University of Graz and University of Krakau. A great change, however, will soon be effected in the establishment of the Vienna Dental Institute. The report of the Committee appointed by the Medical Faculty of the University of Vienna (which consisted of Professor Billroth, Professor Albert, Professor Wittel, Dr. Steinberger and Dr. Scheff, jun.) has been approved by a full meeting of the Medical Faculty. It recommends the founding of a Dental Institute to be incorporated in the Medical Faculty of the University, which shall not only afford an opportunity for the medical student learning the general principles of dentistry, which are necessary for the complete education of every medical practitioner, but shall also train and develop those medical students who purpose devoting themselves to the study of dentistry as a speciality. The Committee, therefore, recommend the appointment of a teaching staff in both the departments of operative and mechanical dentistry. The matter was then remitted to the Minister of Education, and the Dental Institute may, even by this time, be practically *un fait accompli*. Considering, however, that this much-needed advance in the procuring of the necessary means of dental instruction will be limited to members of the medical profession, we cannot but think it a somewhat regrettable fact that there seems little or rather no disposition to extend these facilities in such a way as to affect the bulk of those practising dentistry in Austria.

I was also much interested in a visit to the dental dépôt of

Mr. Weiss, where I specially noticed the ingenious inventions of Mr. Hans Lux, including a constant working saliva injector, worked by a reversible reservoir, combined with an instrument table, spittoon, &c.—an ingenious apparatus for the exact fitting gum block teeth and a compactly arranged portable dental lathe. Mr. Weiss is the spirited proprietor of the *Austro-Hungarian Quarterly Journal of Dentistry*, which contains many interesting articles of original research, which reflect great credit on the able staff of contributors and the energetic editor, Dr. Schmid, of Prague.

(To be continued.)

REVIEW OF BOOKS.

MANUEL DE THERAPEUTIQUE DENTAIRE SPECIALE, et de Matière Médicale Appliquée a l'Art Dentaire suivi d'un Formulaire a l'usage des Practiciens. Par Ch. L. Quincerot. Paris: A. Delahaye et E. Lecrosnier.

IN the preface the author says that in this manual he has indicated the principal therapeutic agents specially employed in the treatment of diseases of the teeth, and of certain affections of the gums. Also that the object of the manual is to facilitate the researches of the student, and to refresh the memory of the practitioner.

To carry out the latter plan, it would have been better had the author set about it in a more systematic manner; or had classified his subject in some way—say, divided the book into organic or inorganic; or, failing that, had arranged it alphabetically.

Chloride of zinc is the substance first mentioned, but this is not the most important drug used by dentists. Among its therapeutic uses it is stated to be employed for overcoming the pain resulting from inflammation of the enamel or of the dentine. The pathology which is here enunciated may accord with the dreamy notions of the author, but, certainly, no such condition of the hard tooth tissues is ever entertained by anyone conversant with the histology of those highly calcified and unvascular tissues.

Thirty-six medical materials are discussed in forty-eight pages, to which are added, as an appendix, twenty-three pages of dental formulæ.

The sins of omission include the absence of several drugs

important to dentists, viz., tannic acid, aromatic sulphuric acid, chloride of ammonium, bromide of potassium, &c.

We should not wish anything mentioned in this notice to lessen the desire of our readers to possess this book; but whatever value it may be to French students or practitioners, we think it will not repay English dentists the trouble of translation.

THE TEETH AND ASSOCIATE PARTS. By John Wood, L.D.S. Edin. and I., D.D.S. Edinburgh: John Menzies, &c.

This work is intended for lay readers, and is for "conveying useful information in the most condensed form possible." Doubtless a knowledge of the maxillary bones might not be without advantage to many, but we fear that the general public will be slow to even appreciate a brief description of the upper and the lower jaw, or a popular account of a method of lancing the gums over an advancing tooth. Yet, nevertheless, we are quite in sympathy with the growing opinion that the rising generation should be taught the elements of physiology. Therefore, consistently with that declaration, we think that "The Teeth and Associate Parts, and what everybody should know regarding them," will serve a good purpose.

It may be well to point out a few errors which have been observed in looking over the pages. The alveolar sockets do not correspond with the number of the teeth, but rather with the number of the roots, as shown by the illustration, fig. 5, p. 10. What is meant by this paragraph on page 14?—"The acute co-existent sympathies, which frequently characterise affections of the teeth, require to be kept well in view in diagnosing diseases of these organs, and the parts with which they are sympathetically connected." The parts with which the teeth are sympathetically connected are, indeed, the whole body.

Upon what grounds are teeth classed into incisors, canines, bicuspid, molars, and *wisdom teeth*? Surely these latter are molar teeth; and ought not the nonsensical term "wisdom tooth" to be abolished from our nomenclature? That the cementum is harder than the dentine will not meet with general acceptance.

Apart from a few shortcomings such as the foregoing, the book is a creditable production, and is calculated to serve the purpose of its publication.

INDEX TO THE PERIODICAL LITERATURE OF DENTAL SCIENCE AND ART, as presented in the English Language. By J. Taft, M.D., D.D.S. Philadelphia: P. Blakiston, Son & Co.

"This work, while making no pretensions to perfection, presents to the student and practitioner a reference to the principal papers which have appeared in dental periodical literature in the English language on every subject interesting to the profession. It has not been the intention to catalogue every paper, but it is believed that few, if any, really valuable ones have been omitted."

"The author's desire and hope is that this work may aid the students and readers of our profession in the examination of that which has been made matter of record, enabling them, with more readiness than before, to ascertain where, and by whom, any given subject has been considered."

The value of such an index as this is very great to one who is at all interested in the periodical literature of our profession. Though not exhaustive, the work must have entailed great labour, the subject-matter being classified under three heads: Index to the Periodical Literature of Dentistry; Index to Dental Periodicals; and Index to Authors. The book consists of 212 pages.

STRAY RHYMES. By Duncan D. Hepburn. Second Edition, with Illustrations. London: W. H. Allen & Co.

Art amongst the members of the Dental Profession is of no mean order, whilst every branch is represented. The exhibitions in connection with the two last annual meetings of the British Dental Association gave testimony to those statements. Mr. Hepburn, alike in his miscellaneous poems, sonnets and songs, portrays considerable poetic feeling; and running through the majority of the pieces religious sentiment is prominent. True to his country, the author sings the praises of the "Immortal Burns," of whom it has been well said he was the "genius of Scotland and the song writer of the world."

WANDERINGS OF IMAGERY: A Collection of Original Poems. By Charles F. Forshaw, Bradford.

Mr. Forshaw's several communications to the RECORD will be still fresh in the memory of our readers, and his poetic "Wanderings of Imagery" present considerable versatility.

MAN'S LOST INCISORS.

By BERTRAM C. A. WINDLE, M.A., M.D. (Dublin), Professor of Anatomy, Queen's College, Birmingham, and JOHN HUMPHREYS, L.D.S.I., Lecturer on Dental Anatomy and Physiology in the same College.

(*A paper read before the British Association and the Central Branch of the British Dental Association ; also published in the "Journal of Anatomy and Physiology."*)

TEETH beyond the ordinary number may occur in the incisor portion of the dental series, and fall, when present, into two categories—*supplemental*, that is, incisiform, though generally smaller than the normal incisors, and *supernumerary* or conical teeth, which do not conform to the shape of any other member of the dental series in man. These teeth have been described by various authors, the following being a resumé of the literature of the subject. Eustachius¹ states that he has observed two cases of supernumerary teeth, and cites Alexander de Benedictis as having also seen such. Meckel² observes that they are more common in the front and in the superior maxilla, and that they differ from the normal teeth in size and shape, being smaller and conical. Generally only a few, as many as eight, have been noticed in each maxilla. This was probably a co-existence of both dentitions. Hunter³ believes these teeth to be always incisors and canines, whilst Owen⁴ goes so far as to state that he has never seen a supernumerary premolar or molar. Wedl⁵ gives a lengthy account of both classes of superfluous incisors. The co-existence of six teeth, two being supplemental, in either jaw he considers to be rare—one extra supplemental tooth being more common. Turner has described a case of a slender, conical, supernumerary tooth, situated in the interval between the two upper central permanent incisors⁶. Supernumerary teeth are placed either amongst the permanent teeth or behind them and within the alveolar arch. Their eruption takes place during the first or second dentition, or

¹ *Tract de Dentibus*, Lugd. Batav. 1707, p. 95.

² *Mém. d'Anat.*, Paris. 1825, vol. iii. p. 361.

³ *Natural History of Diseases of the Human Teeth*, Ed. J. F. Palmer, 1835, vol. ii. p. 51.

⁴ *Odontographia*, Lond., 1840-45, p. 455.

⁵ *Path. des Zähne*, Amer. trans., pp. 101-4.

⁶ *Journal of Anatomy and Physiology*, Oct. 1877. vol. xii.

in the interval between the two ; generally, however, they belong to the permanent series.

Baume's¹ interesting remarks upon the subject may be summed up as follows:—The incisive region having formerly contained more than the present number of teeth, it is not strange to find superfluous teeth in various parts of the os incisivum, as the enamel organ, ordinarily abortive, may assert itself and revert to the primitive type. When this occurs, the teeth seldom reach the highest degree of development, as shown by their conical shape. Granting the loss of incisors, in which part of the series does the deficit occur? The Apes have lost a tooth in each incisive bone since the Tertiary period. These animals possess a diastema behind the lateral incisor, which at first sight might appear to point to this spot as the site of the missing tooth. This theory, however, falls to the ground from the fact that animals possessing the full number of six incisors have also a diastema in this position to allow room for the large canine. Baume believes that the medium incisors are those which fail to appear. Amongst the Prosimii and the Cheiroptera, he goes on to say, there is normally a diastema in this position, and this may also be found sometimes in Apes and even in man, though in the latter the width never appears to exceed 2 mm. This separation is more common in the upper than in the lower jaw. Here may sometimes be found superfluous teeth, and here once Baume noticed two excessively small conical teeth co-existing with those normally found.

Dr. Edwards,² of Madrid, in a paper entitled "The Missing Incisors in Man: Which are they?" arrives at a similar conclusion to Baume, and on somewhat similar grounds.

On the other hand, Professor Turner,³ in a paper on "The Relation of the Alveolar Form of the Cleft Palate to the Incisor Teeth and the Intermaxillary Bones," adopts the theory that the missing incisor is the second, *In*₂. His remarks on this vexed question are of such importance that we reproduce them at some length:—

"Not only," he says, "is six a very common number of upper incisors in various mammals, but as is well known to dental surgeons, three incisor teeth are sometimes

¹ *Odontologische Forschungen—Erster Theil — Versuch einer Entwicklungsgeschichte des Gebisses*, Leipzig, 1882.

² DENTAL RECORD, December, 1885, p. 562.

³ *Journal of Anatomy and Physiology*, Jan. 1885.

developed on each side of the human upper jaw when there is no alveolar cleft. I have now before me the casts of two otherwise normal palates taken from different persons by Mr. Andrew Wilson, L.D.S., one with the milk, the other with the permanent dentition, in each of which six upper incisor teeth have been developed. The question therefore naturally arises which of these teeth is suppressed in the normal incisor dentition in man? Some light is thrown on this question by these cases of alveolar cleft. In the cases of double cleft with two incisors in each half of the projecting intermaxillaries, these teeth would be in dental rotation In_1 , In_2 , whilst the precanine would be In_3 , but in many cases of alveolar cleft, more especially when it is one-sided, only one incisor tooth exists between the mesial suture and the cleft, whilst a precanine is present on its outer side. The precanine, as in the preceding example, would be In_3 , whilst the incisor situated mesially to the cleft would be in the majority if not all of the cases without doubt In_1 ; the suppressed incisor, therefore, would be In_2 and it is not unlikely that in normal human dentition the incisor which does not develop is also In_2 . This view of the homology of the precanine tooth and of the normal lateral incisor, viz., that it is In_3 , is also advocated by Dr. Albrecht.¹ Dr. Th. Kolliker,² however, has not apparently formed any exact conception of its homology; for although sometimes he refers to it as In_3 , at others he speaks of it as if it represented the ordinary lateral incisor, which incisor he obviously regards as a different tooth from In_3 ."

This view as to the position of the suppressed tooth is also shared by Mr. Andrew Wilson.³

Before proceeding to describe our cases and to make any remarks thereon, we desire to state that we lay but little claim to originality in the theories which we put forward. On the other hand, we believe that the questions which we shall pass in review deserve a more systematic examination than has yet been accorded to them, and that the specimens which we have to describe will in some instances afford additional confirmation, in others throw a new light on the actual facts.

Our specimens have been for the most part obtained by ourselves from the clinique at the Birmingham Dental Hospital, the large number of patients attending at which affords an excellent field for the observation of dental abnormalities.

We have also to express our acknowledgments to the following gentlemen for kindly supplying us with specimens from their collections: Dr. Crapper of Hanley, Messrs. Chas. Sims and

¹ *Sur les os inter maxillaires, &c.*, Bruxelles, 1883.

² "Ueber den os intermaxillare des Menschen und die Anatomie der Hasenscharte und des Wolfsrachsens," *Nova Acta der Leop. Carol. Akad. der Naturforsch.*, Bd. xliii., Halle, 1882.

³ DENTAL RECORD, May, 1885, p. 208.

Adams Parker of Birmingham, Mr. Percy May of London, and Mr. J. S. Amooore of Edinburgh.

We have arranged the teeth into eight series:—

Series I. *Supplemental Teeth*.—In this group we have one case of six separate incisors and one of six, the two central being geminous. In both these cases the teeth are in regular series. We have seven in which there were five incisors, in three the additional tooth was on the right side, in four on the left. In all the cases save one they were situated behind the true lateral, generally occasioning some displacement. In one case, however, the intruder was placed between the lateral and central; one case only belonged to the milk dentition, and all were found in the upper jaw.¹

Series II. *Supernumerary Teeth*.—We have four casts in which there are two of these teeth. In two of these the teeth were situated behind the median incisors; in another one was posterior to the left lateral and a second between the right median and lateral. In the fourth one was posterior to the right central, and the second lay between the two median.

We have fifteen cases in which there was one supernumerary; these teeth were situated inside the alveolar arch posterior to the left median incisor in seven cases, the right in five, and in the middle line in three instances. They generally caused more or less displacement of the remaining teeth. All were found in the superior maxilla and all belonged to the permanent series.

Series III. *Co-existence of supplemental and supernumerary with the normal number of incisors*.—Of this we have one specimen (fig. 4). In it a properly-formed though small incisor is placed behind the right lateral and in series with it, and a blunt tooth posterior to the left median which it displaces forwards. This occurred in the superior maxilla, and belonged to the permanent series.

Series IV. *Substitution of a supernumerary tooth for a normal incisor, the number remaining four*.—Of this we have four specimens. The substitution was once each for the right and left median, and twice

¹ After this paper had been placed in type, we obtained a specimen which appears to merit description. It differs from the cases mentioned in Series I., and indeed from any case whose description we have met with, in that it presents six separate well-formed incisors occurring in the *lower* jaw. The two accessory teeth which are In_3 in each case, are placed within the alveolar arch, behind the other incisors.

for the left lateral. These cases belonged to the superior maxilla and the permanent dentition.

Series V. *Substitution of two supernumerary teeth for normal incisors, the number of teeth remaining four.*—Of this we have six cases, the two lateral incisors being invariably those to suffer.

Series VI. *Absence of one incisor, the number being three.*—In two cases the right lateral (superior) incisor was wanting, and in one the same tooth in the inferior maxilla. All these cases belonged to the permanent series.

Series VII. *Absence of one incisor, diminution or malformation of another, the number being three.*—Of this we have four cases. In two the right lateral was absent, and of these in one case the left was conical and in another small but incisiform. In two the left lateral was absent; in one of these the right was small and incisiform, in the other it was conical. All these belonged to the superior maxilla and permanent dentition.

Series VIII. *Absence of two incisors, the number being reduced to two.* Of this we have eight cases, of which seven belong to the superior maxilla and all to the permanent series. In all, the laterals are the missing teeth. The jaws are generally well formed, and there are often gaps between the teeth in the incisor region. The ages of four of these patients were respectively 21, 22, 22, and 17; of the others we have no exact information, save that they were adults. The eighth case is especially interesting, firstly, as belonging to the inferior maxilla—a rare occurrence, and secondly, as it was found in the same individual as one of the cases in Series VII. In this individual the superior maxilla contained three incisors, one being conical, the inferior only two.

We shall now proceed to discuss in order the various points which a consideration of these series raises:—

I. *Man's original dentition included six incisors.*

The consensus of opinion that man formerly possessed six incisors is so general that we need not linger over the various reasons drawn from comparative anatomy upon which the theory is based. Our desire is to add a further proof from our own specimens.

If, as is now generally conceded, supplemental and supernumerary teeth are to be considered as reversions to the original type, then we have in one of our cases (Fig. 1), in so far as the upper jaw is concerned, an instance of the complete archaic

human incisor dentition. Instances of this kind are, as Wedd observes, very rare. Galton¹ quotes from the *Transactions of the Odontological Society* a case in which two perfectly formed supplemental lateral incisors were placed behind the normal lateral incisors in the upper jaw. Our case differs from this in the fact that in it the incisors are in perfect series. Mr. A. Wilson² mentions three cases of this nature, one of which occurred in the temporary dentition. Professor Flower³ records a case observed in the skull of an adult Englishman in the museum of the Royal College of Surgeons of England, in which there were six incisors in the upper jaw, the supplemental pair being placed behind the normal incisors. Dr. Edwards⁴ figures a case in which there were five incisors, one of the median being geminous; this he regards as an instance of the co-existence of six incisors. We have described a somewhat similar case above, in which both the median incisors were geminous. An interesting case of a somewhat similar nature is described by Dr. Kirk.⁵ It occurred in the lower jaw in connection with the milk dentition. The right lateral was normal, the right median was twice its customary breadth and divided longitudinally into two halves by a deep groove, extending from the middle of the cutting edge of the crown to the lower end of what remained of the fang, giving the appearance of two teeth fused together. The root of this tooth was unfortunately so absorbed that its condition, whether single or double originally, could not be made out. The left median was normal, and its fang was about half absorbed. The left lateral was twice its ordinary breadth and longitudinally divided by a groove like the right median, and the root was unabsorbed and distinctly bifid for at least a third of its length.

The permanent teeth presented on their appearance no abnormality.

Cases in which five normally-formed incisors have been observed are fairly numerous, and seven such are included in our series. Supernumerary teeth are even more numerous both in our own experience and in that of other observers. We have already

¹ *Journal of Anatomy and Physiology*, 1872, p. 428.

² *Loc. cit.*

³ *British Journal of Dental Science*, Dec. 15, 1879, p. 799.

⁴ *Loc. cit.*

⁵ *Journal of Anatomy and Physiology*, vol. xviii. p. 339.

described five cases in which there were two, and fifteen in which there was one. One case shows an unsuccessful attempt at reversion to the full dentition; here a small incisiform tooth is placed behind the right lateral and in series with it, and a blunt supernumerary tooth posterior to the left median. Mr. J. S. Amoores has afforded us information of an interesting case in which a supplemental tooth in the temporary series had a permanent successor. This case throws much light upon the question of the derivation of such teeth. Viewed from the light of atavism, these cases afford fresh confirmation of the theory that man's incisor dentition was originally In $\frac{3-3}{3-3}$. It is seldom that he

attains to it in the upper jaw, still less frequently in the lower, never, so far as we are aware, in both simultaneously. But, on the other hand, in quite sufficiently numerous cases he regains one of his lost teeth, either well or ill-formed, or both in an imperfectly-formed condition; and, finally, this gain may occur in both dentitions.

II. *Man's lost incisor is the lateral or I_n .*

We approach this portion of our subject with much greater diffidence, since the position which we maintain differs from that which has the weight of Professor Turner's name attached to it, and from the opinion which Baume has advanced. We shall first consider the view put forward both by Baume and by Edwards, as that which seems to us least tenable. The two chief reasons advanced by Baume are, firstly, that a diastema exists sometimes in apes and in man between the central incisors, and secondly, that supernumerary teeth are found either between the median incisors or immediately behind them. With respect to the first argument we are bound to say that our own experience in no way confirms Baume and Edwards' statements respecting the frequency of occurrence of a separation between the median incisors. For some considerable time we have made observations upon this point, and are inclined to believe that any noteworthy separation at the point indicated is, at least in this district, uncommon. And it must be remarked that, as dental abnormalities are numerous amongst the class of patients attending at the Dental Hospital in this town, we should certainly have expected to find a fairly large number of instances of the separation, were it the marked feature which it has been claimed to be. In

connection with the second argument, we think that any one who has examined such a series of models as are at our command will be struck at once by the fact, that whatever teeth are added or suppressed, the two medians typical in shape are invariably, or almost absolutely so, present.

Thus in the case of six incisors, if the question be doubtful whether In_2 or In_3 be the intruder, at least it is obvious that In_1 is the same in shape as the central in any normal series.

It is quite true that supernumerary teeth exist frequently in the middle line, but very rarely to the exclusion of the median. Moreover, we have specimens which prove beyond a doubt that the present lateral incisors may take up their position behind the median, which at least goes to prove that a tooth in this position need not necessarily be a suppressed median. We have specimens showing this occurrence in both upper and lower jaw, and affecting one or both laterals.

Finally, there are two other arguments based upon the dentition of *Homalodontotherium* and the undoubted suppression at present occurring of the lateral incisor, both of which will be dealt with at greater length in considering Professor Turner's theory, and both of which apply with even greater force to the refutation of that of Baume and Edwards.

Turner's theory is based upon facts learnt from a study of a number of cases of alveolar fissure. It is needless for us to repeat his remarks, which we have quoted at an earlier period. Their weight must be felt by all who have studied the subject, and we can offer at present no explanation of the apparent contradiction which the facts he cites give to our theory. We would, however, venture to urge the following points in support of the view which we have taken that the lost incisor is In_3 .

1. The theory that man possessed six incisors is amongst other things based upon the dentition of *Homalodontotherium*. The dentition of this animal is, according to Tomes,¹ "chiefly instructive in that the teeth in close juxtaposition one with another present an exceedingly perfect gradation of form from the front to the back of the mouth, no tooth differing markedly from its neighbour, though the difference between, say, the first incisor and first molar is exceedingly great. In Professor Flower's words, 'It

¹ *Manual of Dental Anatomy*, p. 8.

is only by the analogy of other forms that they can be separated into the groups convenient for descriptive purposes, designated as incisors, canines, premolars, and molars.' In viewing the gradational characters which do exist between the various human teeth, it must not be forgotten that some links in the chain have dropped out and are absent. Mention has already been made of the full typical number of mammalian teeth being 44, that is:—

$$\text{In} \frac{3-3}{3-3}, \text{C} \frac{1-1}{1-1}, \text{PM} \frac{4-4}{4-4}, \text{M} \frac{3-3}{3-3} = 44.$$

The human subject does not possess the third incisor nor the first two premolars, so that a somewhat abrupt change of form in passing from the incisors to the canines, and from the latter to the bicuspid, is no more than might be anticipated."

It will be seen from this quotation that Tomes puts forward the theory which we support upon the evidence of Homalodontotherium. If we suppose either In_1 or In_2 to be the missing tooth, the gradation theory falls to the ground, unless indeed we assume that *pari passu* with the suppression of one or other of these teeth, the remaining become modified in form, so that the gradual alteration in shape to the canine is lost, an assumption which is not supported by any facts of which we are aware.

2. It has long been held, and the facts which have been brought forward, together with those which we have yet to deal with, appear amply to warrant the belief that the lateral incisor In_2 is at present being gradually suppressed. This being so, it seems *prima facie* much more likely that the tooth which has already been lost is that which was next behind it in the original dental series.

3. In all those cases in which there are six or five incisor teeth in series, the additional tooth is, in our opinion, indisputably placed behind the lateral incisor, and is, in fact, as Dr. Albrecht and Professor Turner have styled it, a "precanine." This feature is well shown in one of our specimens, where a small incisiform tooth is placed behind the true lateral and in series with it. Another again affords an admirable example of a similar state of affairs. On the right hand there are present In_1 corresponding to In_1 on the left, In_2 corresponding in like manner to its fellow of the opposite side, and behind it, and in series with it, is an In_3 which forms a good instance of a tooth tending towards the shape of the canine, and bridging over the interval in shape

normally observed between this tooth and that of the region in front. We believe that an examination of specimens of superfluous incisor teeth placed in proper series will go entirely to prove that the suppressed incisor is the third, and the argument thus supplied we consider far more conclusive than either of the others which we have advanced, valuable as they are, as corroborative evidence.

III. *This loss is consequent upon the contraction of the anterior part of the jaw.*

The fact that the jaws and alveolar arches of higher races are less well formed than those of lower is sufficiently recognised. On this point Oakley Coles¹ writes as follows:—It seems to have been proved fairly conclusively that irregularities and malformations of the upper jaw and palate are met with much more frequently amongst highly civilised races than amongst those who have lived, or are still living under semi-barbarous conditions. And it would further appear that the same irregularities are of more frequent occurrence amongst the upper and middle grades of society than amongst the working classes. The two hundred ancient skulls examined by Messrs. Cartwright and Coleman in the crypt of Hythe Church, presented without exception perfect maxillæ and extremely well-developed alveolar arches; while the more extensive researches of Mr. J. R. Mummery, extending to upwards of three thousand skulls of ancient and modern uncivilised races, lead to the conclusion that the perfect type of both dental and maxillary arches has been uniformly maintained amongst nations of simple habits and lives. Again, Dr. Nichols² of New York, who has examined the mouths of thousands of Indians and Chinese, affirms that the jaws of both races are universally well formed and amply developed.”

Darwin³ and Herbert Spencer⁴ have both noticed the decrease in size of the jaws in civilised races as compared with uncivilised, and in the upper classes of the former as compared with the lower. The latter states that the maxillæ of Australians, Negroes, and

¹ *Deformities of the Mouth*, p. 34.

² Norman Kingsley, *An Inquiry into the Causes of the Irregularities in the Development of Teeth*.

³ *Descent of Man*, p. 33.

⁴ *Principles of Biology*, vol. i. p. 455.

ancient British are absolutely larger than those of the modern English, and, when considered in connection with their smaller skeletons, the difference is of course very much more marked. We are inclined to believe, though we have not yet had an opportunity of working out the subject as fully as we could wish, for lack of material, that this decrease in size is exhibited in perhaps the most marked manner in the incisive region. Topinard¹ states that the elliptical form of jaw is that which is most commonly met with among inferior races, the parabolic being that which more peculiarly belongs to the superior. From an examination of these two types of jaw the former certainly appears to afford a much more roomy incisive region.

A comparison between the various casts in our possession of English teeth and those casts and skulls of uncivilised races which we have been able to examine, leads us to the conclusion that the incisive region in the latter is much less contracted than that of the former.

In a paper² "On the so-called Serpent Teeth" Callender puts forward the theory that certain abnormalities of the incisive region may depend upon arrested or stunted growth of the incisive process of the superior maxilla. The same theory will help to account for the contraction of the incisive region leading to the suppression of teeth. If the incisive process be stunted in its growth then the proper development of the inter-maxillary bone is prevented and the incisors are thrown inwards or suppressed.

When it is considered that the incisor teeth are those used for cutting or dividing food, and when it is remembered how much their labours have been lessened amongst civilised races by the careful cooking of food, there will be no difficulty in assigning a reason for the gradual disappearance of these particular members of the dental series.

IV. *Suppression of the two present lateral incisors is now taking place.*

Cope³ has ventured to predict that in future the lower races of

¹ *Eléments d'anthropologie générale*, Paris 1885, p. 956.

² *St. Bartholomew's Hospital Reports*, vol. vii. p. 149.

³ As quoted by Schmidt in *The Mammalia*, Internat. Sci. Series, Lond. 1885, p. 300.

men will retain the dentition of the present day, whilst those intellectually higher will possess a diminished formula of

$$\text{In } \frac{1-1}{2-2}, \text{ C } \frac{1-1}{1-1}, \text{ PM } \frac{2-2}{2-2}, \text{ M } \frac{3-3}{3-3}$$

or

$$\text{In } \frac{1-1}{1-1}, \text{ C } \frac{1-1}{1-1}, \text{ PM } \frac{2-2}{2-2}, \text{ M } \frac{2-2}{2-2},$$

and the view which he puts forward as to the disappearance of the incisors is shared by other authorities on odontological subjects, whose opinions have been quoted in an earlier part of this communication.

We think that our Series, IV. to VIII. inclusive, afford good examples of this process of suppression in its various stages. Series IV. contains cases in which there are at present three well-formed incisors and one of lesser development, a conical or supernumerary tooth. Series V. shows a still further advance in the substitution of a supernumerary tooth for one of the three still left of the normal shape in the former category. In Series VI. one tooth has actually disappeared. In Series VII., besides the suppression of one tooth, we have malformation or imperfection of a second, whilst in Series VIII. we finally reach the complete condition of suppression of both lateral incisors. We quote the ascertained ages as far as possible of the cases in this series, in order to show that these are not cases in which from immaturity the missing teeth might yet present themselves. In one case, three incisors, one being conical, existed in the superior maxilla, two only in the lower, those present and perfect being the central. This is interesting as being the closest approach to the reduced dentition predicted by Cope with which we are acquainted. It will be noticed that, of twenty-five cases included in this series, twenty-three are instances of suppression of greater or less degree of the lateral incisors, two only of the median.

Amongst these cases of suppression are three which form an interesting family group. The parents of these three children belong to the upper classes, were not related to one another, and present themselves no dental abnormalities. The eldest child, a girl aged 22, has neither lateral incisor in the upper jaw; the second, also a girl aged 20, wants the right lateral; whilst the third, a boy aged 17, wants, like the eldest, both the permanent laterals, but the deciduous right lateral is still present.

We think that, so far as the evidence from dental abnormalities goes, the case for the present suppression of the lateral incisors may be considered to be fairly complete.

V. *Conical Teeth a Reversion to the Primitive Type.*—That the simplest form of tooth is the conical is an obvious fact from Comparative Anatomy. It is interesting to observe, then, that in most of the cases in which an attempt at a reversion to the full dentition is being made by nature, and in others in which a portion of the present dentition is being suppressed, the abnormal tooth, being apparently unable to attain to its full development, remains of the same shape in which in lower animals is normal.

It is instructive to find that this reversion to the conical shape may be found in supernumerary teeth in other animals. We have a skull of a *Midas rosalia*, in which in the upper jaw there is a supernumerary tooth which we consider to be a premolar. This tooth has the same conical form as the supernumeraries in Man, and differs thus very markedly from the shape of its fellows of the same series.

IMPLANTATION OF TEETH IN NEW SOCKETS.

IN an editorial article the *Independent Practitioner* says:—Some months since we received from the author, Wm. J. Younger, M.D., of San Francisco, Cal., a pamphlet with the title "Transplantation of Teeth into Artificial Sockets," in which was recounted his experience in forming artificial sockets in jaws which had long lost their natural teeth, and the transplanting of extracted teeth to them. We were aware that sound teeth had often enough been placed in the sockets from which diseased ones had been freshly removed, but this drilling of holes in edentulous jaws and inserting teeth seemed so unscientific, unphysiological and non-surgical, that we were rather amazed at the assurance of the dentist who had calmly proposed such a thing. We were taught that the retention of a tooth in the jaw depended upon the vitality of the pericementum, and how could a hole bored in the bone with a drill be endowed with pericemental life? The idea was absurd, and we had prepared a gentle rebuke for the unscientific presumption of the California dentist. But before the publication of the review of his pamphlet, came letters from reliable Californian friends and correspondents, who avowed that they had seen this done, and

with apparent success. In the September number we published one such, but with rather a feeling of compassion for the credulity manifested. This letter was followed by others from candid eastern men, who saw the operation performed during a visit to the Pacific coast last summer. An article was written for this journal by Dr. Julien W. Russell, of Brooklyn, who was one of these, but the whole affair seemed so unscientific that it was withheld, notwithstanding the candid manner in which the subject was presented. We waited for yet further testimony, for the assertion was now made that teeth which had been extracted for some time and which were in a desiccated condition were thus implanted.

Finally, Dr. Younger came east for the avowed purpose of demonstrating this dental absurdity, and has visited New York, Philadelphia, Boston and Buffalo, in each place exemplifying the operation. We were bound in all courtesy to receive him and give him an opportunity to attempt the feat, for he asked no money of any one; he had no patent gim-cracks to sell, and his clinics were given freely, without pay, and seemingly for only the most commendable of purposes. He was contributing his time and money for what he believed was the good of dentistry, and notwithstanding the fact that we believed him to be mistaken in his theories and irrational in his practice, we were anxious to see what would be the effect of such an operation, and accordingly earnestly invited him to visit Buffalo.

We have been thus, perhaps, unnecessarily candid in reviewing the presentation of the new operation, lest we might be charged with a too ready credulity. Concerning the operations in New York, Philadelphia and Boston, we have no personal knowledge, but we are assured that they so far seem to be successful. It appears, also, to be established by sufficient testimony, that a patient was presented in New York for whom had been implanted a tooth in an artificial socket more than a year previously, and it was impossible to detect any marked differences between it and its natural neighbours.

Of the clinic in Buffalo, given in our own office, upon a patient of our own selection, and in the presence of Dr. Park, professor of surgery in the University of Buffalo, and that of a number of our city dentists, we can speak knowingly. Dr. Younger laboured under disadvantages, for, not knowing what was wanted, nothing had previously been prepared for him. The patient was a young

man, a student in the medical college. Nearly a year before he had lost a right inferior second bicuspid, and it was proposed to insert a tooth in its place. Not a trace of the socket remained, and there was considerable absorption of the alveolus, which made necessary a tooth with a long crown. None such could be readily found, until Dr. Younger himself visited the office of one who extracts a great many teeth when, out of a bushel or more of dried up, long extracted dental organs, he found one which the donor said had rested in the dental Golgotha for at least three years, among thousands of its foul companions. This was carefully prepared by removing the debris from the pulp chamber and canal, thoroughly disinfecting it with a one to one thousand solution of bichloride of mercury, and filling the root with gutta-percha. It was then left in a warm solution of the corrosive sublimate while the socket was prepared.

This was accomplished by carefully dissecting back the gum, and with a small trephine boring a hole in the alveolus, which was enlarged to the proper size and shape with burs. The tooth was occasionally tried in the socket to determine the proper direction, size and depth, and when these were secured it was forced down to its proper position and left there, the socket having been previously thoroughly syringed out to remove all debris. Its perfect occlusion was now secured by dressing down the cusps a little, when the case was dismissed. So accurate was the fit that the tooth was held firmly in position by mechanical adaptation alone, and no ligatures or other appliances were used to retain it. The occlusion with the superior tooth was, of course, sufficient to prevent its rising in the socket. No after-treatment was recommended, but the whole thing was left to the care of nature. The operation was dexterously performed, the occlusion was perfect, and the pain experienced by the patient was not greater than that necessary in filling a cavity in a rather sensitive living tooth.

At this present writing the tooth has been in position about a week, and aside from a very little soreness, the necessary result of the wound, there has been no bad symptoms, and the case appears to be progressing favorably. Of course the time is not sufficient to afford any reliable index of what the final result will be, and had we not credible testimony that cases analogous to this have gone on to apparent success for a year or more, it would not be quoted. As, however, the operation is attracting some attention in the

profession, we have thought it not out of place to detail the manner of its performance, reserving the right to report further upon this instance at a subsequent day.

If this operation should prove to be a feasible and successful one, it will certainly require the revision of our ideas of physiological law. It must not, however, be understood that we are committed to it, or are fully convinced that it is a practice which may unhesitatingly be commended. We are content to wait further developments. And yet, if a smooth ivory peg may be driven into bone and in time be encapsuled within the tissue, or perhaps united to the circumjacent bone, why is it not possible for a tooth to be made to grow in an artificial socket? We know that the spongy portions of the maxillæ are the most accommodating of the bodily tissues, and will submit to almost any surgical or traumatic interference and yet return to a state of health. We also know that the proliferation of bone corpuscles is not entirely dependent upon periosteum, but that cavities artificially made in bones will be healed from the bottom by granulation. In numerous instances we have replanted teeth that have been out for many hours, and some of these have remained in good condition for ten years, and are seemingly perfect yet. At the present time there is under our care the case of a boy eight years of age, whose central incisor was knocked out, and practically remained out, for more than forty hours. The tooth was incomplete in growth, and there was nothing like a finished foramen, the end being open the full size of the root. Yet this was inserted, after proper preparation, and now, three weeks and more after the accident, it appears to be well united and comparatively solid and healthy. But all this is but little analogous to the implantation of foreign teeth in artificial sockets.

Dr. Younger is careful to select teeth the roots of which are apparently covered with pericementum, no matter in what a desiccated condition this may be. He believes in the persistent vitality of this membrane. Although we are aware that membranous tissue differs from most of the other tissues of the body in the readiness with which its presence, even when long dead, is tolerated, as is evidenced by its occasional use in surgery, we cannot believe that it is because it has retained any vitality. This seems to us absurd. That Dr. Younger has made his only failures, according to his own statement, in the insertion of teeth that were

without the dried pericemental membrane, may be due to the fact that it may act as a protection to the primary deposition of protoplasmic matter, which finds a resting place in its meshes, and thus acts like the cells of the sponge in artificial grafting.

It would be interesting to determine just what is the nature of the relation of the tooth and bone in these implanted cases—whether a pericemental membrane is formed and the organ held in position in the usual way, or whether there is a solid, bony union. That it is not merely a mechanical adhesion seems abundantly proved, for in some of Dr. Younger's cases the gum has been found perfectly adherent to the neck of the tooth. It is to be hoped that, at some time, some of these implanted teeth that seem entirely healthy may be extracted and critically examined, for we think it must be admitted that a union of some kind has really been established between teeth long extracted and the walls of artificially formed sockets.

THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

THE first Ordinary Monthly Meeting after the recess was held on the 1st November, Mr. CHARTERS WHITE, M.R.C.S., L.D.S. Eng., President, in the chair.

THE PRESIDENT, in a few appropriate sentences, welcomed the members back to the scene of their labors, and hoped that their renewed energies would be brought to bear in furthering the welfare of the Society and the profession generally.

The announcement by the President that it was proposed to honour Mr. George A. Ibbetson by electing him to honorary membership was heartily received, and subsequently the election was unanimously carried by show of hands.

Mr. STORER BENNETT, the Curator, reported several additions to the museum; among them were two specimens sent by Mr. Dunn, of Florence, who thought them two jaws from an Etruscan tomb. In that case they would be highly interesting, as they would probably be about 2,500 years old—not more than that—as prior to that period the Etruscans practised cremation. The Curator also announced that the Society had purchased the skull of a Manatee.

At the request of the President, Mr. HEPBURN (one of the Secretaries) read a letter from Mr. James Parkinson, the Treasurer,

announcing in felicitous terms the presentation to the Society of the portrait of Mr. T. A. Rogers by a few of his friends. The letter dwelt upon the esteem and regard in which Mr. Rogers was held; to the great services he had rendered to the Society and the profession generally during the last thirty years. It referred to his being one of the active Secretaries at the first meeting of the Society in 1856, which office he held until 1861; to the services he had rendered on the Council; to his being unanimously elected President in 1865, and again in 1881. Reference was also made to the various other offices he had filled outside the Society, and to the qualities of kindness and geniality which distinguished him. Mr. Parkinson concluded by trusting that the Society would receive this addition to their walls with a hearty welcome.

The announcement was warmly applauded, and the PRESIDENT, in accepting the presentation officially in the name of the Society, said it was perfectly unnecessary for him to supplement the eulogium contained in Mr. Parkinson's letter, as he felt those remarks really required nothing to be added to them; but, in his capacity as President, he accepted the portrait in their name, and felt they would never look upon that counterfeit presentment without thinking of what represented amiability, dignity and warm-heartedness.

Mr. STORER BENNETT showed models and mentioned a case of imperfect dentition which had been brought to his notice by one of the students of the Dental Hospital (Mr. Colyer) a short time ago. It occurred in a girl, aged 16, who had in the lower jaw only two permanent molars, four temporary molars, two canines, and two incisors; the incisors were small wedge-shaped teeth, the jaw itself was small. Although the teeth were deficient in the lower jaw they were very much more so in the upper jaw, which contained only the roots of two canines and the roots of two first permanent molars. Inquiries into her family history failed to reveal anything which would account for the abnormality.

Mr. C. S. TOMES also mentioned a case somewhat on the same lines as the foregoing. In a man, aged about twenty-five, on both sides of the lower jaw and one side of the upper jaw, the whole molar series were down to the level of the gum. On the right upper jaw the six-year-old molar and the twelve-year-old molar were down nearly to their normal level; but the occasion of his consulting Mr. Tomes was that the twelve-year-old molar was very

painful, and on looking at it it seemed as though the wisdom tooth was pressing upon it. On taking hold of it, to his surprise, it came away; it had not, and never had, any roots. He then examined the six-year-old molar on the same side, which was also down to the masticating level, and he thought it was a matter of legitimate inference that none of the molars had any roots. Mr. Tomes thought the point of interest was the fact of three separate checks at three different periods, viz., at the six-year-old molars, the twelve-year-old molars, and the wisdom teeth. Mr. Tomes also showed a central incisor which had been placed in his hands by Mr. J. S. Turner, who had extracted it because it was loose. When he took it out he found it had no root; there was no history of an accident, and nothing was left in the socket, so that it had either never formed its root or else it had been absorbed.

Mr. R. H. WOODHOUSE, on examining the tooth, said it had been stopped at the side, and the stopping had been there some years; the stopping being on the mesial surface would give considerable pressure and, he suggested, would probably account for development having been arrested.

Mr. COLYER mentioned a similar case to those referred to by Mr. Storer Bennett and Mr. Tomes, which occurred in his father's practice. A gentleman, aged about thirty, had, of the permanent set, only the four six-year molars; there were also seven temporary molars, and two malformed incisors, one in each jaw. Beyond suffering from indigestion he was healthy and well developed. The temporary teeth were extracted and artificial dentures fitted. These he had now worn for some years, but no more teeth had made their appearance.

Mr. S. J. HUTCHINSON brought before the notice of the Society one or two little contrivances which he had found useful in his practice. He said that at several previous meetings they had had many interesting hints from Dr. St. George Elliott—little methods shown which he had found useful in practice. He (Mr. Hutchinson) first alluded to a difficulty which they must all have experienced in mounting gum sections, viz., that of avoiding the dark lines in the joints. One way of overcoming this was to put the case in chlorate of lime for six or eight hours, which would entirely clean out the black lines which disfigure gum blocks. Another matter was with reference to pivot teeth. He did not know what the usual practice of members was, but one cuts off a tooth, drills out the

fang, and prepares it in such a way that the patient is to come another day for a pivot to be fitted in, and goes away with a gap in the mouth. Now, to avoid this gap in the mouth, it was his custom to have a number of what he might call "jerry built" teeth ready, a variety of shades of incisors, laterals, and canines, which might be fitted in temporarily.

Another small hint. Probably they had not unfrequently been troubled in matching artificial teeth where one or two necessary teeth had been wanting; the natural teeth were too dull on the surface or were coated with tartar, and nothing would enable them to get a good match. Perhaps it has been the practice to scale the tartar off; well, a little fluoric acid wiped over the artificial teeth would give them just that roughness which would make them undistinguishable from the natural ones. The fluoric acid must be kept in a gutta percha bottle.

Lastly, would he mention a way of getting "a dentist's third hand;" and that was a very simple way of fixing to a mouth mirror a small piece of wire which could be pierced into a cork. The cork can then be placed between the patient's teeth, and the mirror fixed at any required angle. This second mirror would be found very useful on foggy days in focussing a ray of light.

The PRESIDENT, remarking upon the interesting nature of the hints, said he was glad to have these little "wrinkles" brought forward, believing that they contained the germ of much that was useful. The suggestion with reference to pivots was a very practical one. There was nothing more annoying to a lady patient than to have to proclaim to her friends, by the sudden appearance and disappearance of a gap, that she had taken to artificial teeth. At the same time, he thought that these temporary pivots should be made very secure.

Dr. ST. GEORGE ELLIOTT inquired how Mr. Hutchinson fixed his temporary pivot. A plan which he sometimes adopted as a temporary expedient, in order to ascertain whether a root would bear a pivot or not, was to take an ordinary plate tooth, attach to it with soft solder a German silver pin, insert this into the foramen, and pack amalgam round the head and against the back of the tooth. This could all be done in from fifteen to thirty minutes.

Mr. HUTCHINSON replied that he used a hollow pin and floss silk, and took care to make the tooth secure. He had no fear of the patient not returning to have the operation completed; the

effect of his temporary stop-gap was not good enough to satisfy a patient even for six weeks.

Mr. F. J. BENNETT said, with regard to jointing continuous gum work, it is of the first importance to have them fitting well ; but the black line might be prevented by rubbing a little fossiline or osteo over the crack and allowing it to harden. He would like to ask if anyone could tell him how to prevent the black oxide which forms on the cutting surface of American teeth.

Dr. ELLIOTT remarked that it might not be generally known that the characteristic difference between American and English teeth is, that the former are *pressed* into the mould while the latter are *poured* in.

With reference to another matter, most of the members would be aware that next year there is to be a meeting of the International Medical Congress at Washington, and he had received a letter from Dr. Taft, acting for the Dental Section, stating that they desired to ascertain at the earliest possible moment who would prepare papers and work for the Section of Dental and Oral Surgery, and asking him if he would give him the names of 15 or 20 dentists in Great Britain and Ireland who could, and would, prepare papers. It was intended to prepare 10 or 12 operating chairs for the best operators in the world. Benches, lathes, &c., would be provided, and facilities would also be made for various branches of scientific work, operations and treatment of exposed pulps and diseased gums, clinics also would be arranged for.

The PRESIDENT said no doubt many of the younger members would avail themselves of the invitation, although he did not think he should venture to do so himself.

Dr. ELLIOTT : It is very necessary that the Secretary should know in advance the names of the gentlemen who intend to accept the invitation. He would like to say something which was foreign to the subject, viz., that the two colleges, Harvard and Michigan, had lately resolved that the preliminary examination can be held in this country, and, he believed, in any other country.

Mr. WALTER COFFIN said he had been requested by the inventor of a new process—a process for permanently facing vulcanite plates with a metallic surface—to introduce the subject to the notice of the Society. Mr. M. G. Cunningham had specimens which he would show the Society, and from a very long acquaintance with vulcanite work he (Mr. Cunningham) had come

to the conclusion that it would be an advantage to place a metallic surface on the rubber rather than by swagging in the usual way.

The method seemed, shortly, to be this: When the ordinary vulcanite piece was so invested in the flask that the flask is open, the unpacked rubber was to be separated from the model and a thin layer of filings or precipitated gold was first spread finely between the model and the vulcanite, then upon either one or the other both a thin layer of calico was placed to prevent the further squeezing of the rubber. The process seemed only to add a few minutes' labour to the ordinary process of making a rubber piece. Mr. Cunningham also wished him to say that a surface properly prepared in this way could be increased by the electro process to any thickness.

The PRESIDENT remarked that he had had the pleasure of seeing the specimens which Mr. Cunningham had brought, and they certainly added very much to the beauty of the piece, but he was puzzled to understand how an interrupted surface of metal could be made continuous by the bridging over of the intervening spaces of non-conducting material.

Mr. CUNNINGHAM replied that whatever the explanation might be, there was no doubt of the fact that the interrupted surface first obtained could be made continuous by electro-plating.

Mr. WALTER COFFIN: The surface of the rubber, when it first comes out of the flask, is of course, not a continuous surface but a mottled surface, therefore practically each deposit would be separated from its neighbour and surrounded by rubber; they, therefore, had a discontinuous surface to commence with. The interesting point to him was, that the surface might be deposited upon *electrically*. He had made some experiments himself, with a view of testing this, with the result that he had himself been unable to get any deposit on a surface fairly well covered with *gold filings*, but with a gold *precipitate* he had been able to get a very fair deposit. The only point, to his mind, seemed to be whether or not a sufficient quantity of precipitate could be used, a great deal being lost in the process. He felt bound to say that his experiments were hardly fair to Mr. Cunningham, as he had made them quite in an independent way.

Dr. WALKER had tried the process that Mr. Coffin had so clearly described to them, and Mr. Cunningham had kindly called

on him and explained the process he was endeavouring to induce them to adopt. He had previously tried electro-plating dentures and, so far as he had gone with it, his first experiments were the same as Mr. Coffin's, and he found in a very short time the deposit stripped from the vulcanite; but when he saw Mr. Cunningham's method, and adopted it, he found he got a clear anchorage for a deposit of gold. He tried an upper piece, and was most careful as to the cleaning of the filings, and, to his great pleasure, it came back beautifully electroed. It had been worn by a patient five weeks and had been returned to him; he had washed it in soap and water, and the deposit gave no evidence of rubbing or wearing off. He had made some three or four cases by this process and, while so far successful, the longest test he had given them was five weeks' wear.

Mr. CUNNINGHAM said the point which appeared to him to be of great importance was to get an electro deposit in the first instance. He was not surprised that an amateur should fail to get the deposit, but he was very much surprised that a professional electro-plater should be unable to do so. The surface merely required to be "quickenened" by dipping into a bath of nitrate of mercury, a practice known to all electro-platers.

Mr. COFFIN desired to explain that he particularly instructed his electro-plater to use no preparation to facilitate the deposit, as he understood Mr. Cunningham that his method rendered it unnecessary.

Mr. RYMER said he had no doubt many members had in former years used gold leaf, as he had done, for coating vulcanite, and it gave a very pretty surface, but the difficulty with the gold leaf was that it got worn off by friction. The question to his mind was, what thickness would be necessary to prevent its wearing off by this method?

Mr. COFFIN had tried years ago every means of coating rubber by the use of plain gold leaf and sponge gold leaf, and he was inclined to think it was not so much *wear* as *peeling away* that had been the difficulty.

In reply to questions by the President, Mr. COFFIN said that it was a very interesting scientific question as to how the conducting is brought about, but he believed the theory was, that the deposit takes place and spreads—like a blush, as it were—from the conducting point over the whole surface. Referring to his experiments,

he found that the deposited coat was perfectly inseparable from the surface, and he felt it due to Mr. Cunningham to say that those preparations in which he had succeeded had been done without any preparation of the surface used in the trade such as he spoke of. He had used extremely fine particles, but upon the precipitate the electro deposition was perfect.

Specimens of the work were handed round and admired, and, there being no further discussion,

Mr. WALTER (of Germany) showed and explained a hydraulic press for obtaining well shaped plates, and the meeting separated.

THE INTERNATIONAL MEDICAL CONGRESS, 1887.

THE prospects of the approaching International Medical Congress have steadily improved. The differences of opinion that at one time threatened to paralyse the efforts of those who were organising the meeting have been almost, if not entirely, smoothed away. The Executive will be very pleased to receive any offers of help. The most convenient form such help could take would be, that those who wish to read papers should forward rough sketches of them for the approval of the Executive. The plan of work in the Dental and Oral Section of the Congress is designed to embrace both operative and prosthetic dentistry. Under the head of operative dentistry will be presented the different methods of treating natural teeth, with all practicable filling materials. So far as possible the different systems in use in the various countries represented will be produced and illustrated by different operators.

In the department of prosthetic dentistry, the different styles of crown and bridge work will be demonstrated by skilled operators from the several countries represented; also, all the forms of artificial teeth and plates in use, including continuous gum work, the various styles of gold and other metal work, including cast plates; and any new or valuable improvement in the different plastic materials, such as celluloid and rubber, or their various combinations. It is expected that the actual construction of all prosthetic work will be carried on by the various operators present. The conduct of these clinics in both departments will be specially arranged, so that every facility for minute examination of the mode of procedure adopted by some of the most

skilful and accurate manipulators may be afforded to all present. It is desired that the distinctive instruments and appliances for every department of work may be brought by the respective operators, or furnished by the committee in charge. The work will be distributed through a series of apartments, so arranged as to give ample opportunity for observation. The time devoted to this work will not interfere with other work of the section. Rooms will be provided, with a number of instruments, for microscopic examinations of specimens, and the details of such work will be shown. Other departments will be provided for, showing the results of original investigations upon scientific or practical subjects bearing upon dental art. Papers to be read at the Congress, or abstracts of them, must be in the hands of the Secretaries by April 30th, 1887. The Secretaries of the Dental and Oral Section are Dr. E. A. Bogue, 29, East Twentieth Street, New York City, and Dr. F. W. Rehwinkel, of Chillicothe, Ohio. They will be pleased to receive communications for the Congress at as early a date as practicable, and, in order to facilitate the speedy formation of a definite programme, it is desirable that those who intend to contribute should send abstracts of their contributions with as little delay as possible.

GENERAL MEDICAL COUNCIL.

THE Autumn Session of the General Medical Council was opened on November 16th.

In the course of his address, the PRESIDENT (Sir Henry Ackland, M.D.), referring to the result of the visitation of examinations, said :—The next report you will receive is in an incomplete state. It is one on the visitation of teaching; on its methods and its appliances. Time was when men seemed to take a melancholy, or, to speak more truly, a cheerful view of high percentages of rejections. A more instructive idea of the use of visitation is now occupying the minds of many men. They ask—Why do so many fail? And they desire to know, not so much what they are examined in as what they are taught; and not only what they are taught, but how, and with what appliances. It is not, however, to be supposed that this view has been neglected. Still, all persons who are interested in the progress of education will look with extreme interest on a full account of the appliances and

methods of teaching the sciences at the foundation of medicine, and the means of acquiring knowledge in the practice of its several parts, as they prevail in the medical teaching institutions in the kingdom. These are known to vary much in their scope, as well as in their power and opportunities. It is possible that the less thoughtful portion of the public may wonder that labour should be expended at the end of the nineteenth century on a matter which would be supposed to be already well understood. No member of this Council, however, but feels the difficulty of blending into practical medical education the sciences, whose mass increases daily, and each of whose votaries has a tendency to claim the attention of students, if not exclusively, yet absorbingly, to the special work of his own life. You will be asked to receive the Committee's report on this matter, and to give further instructions with regard to it.

Mr. FARRER (the solicitor to the Council) presented a report from the Dental Committee with reference to the case of Thomas Maden, the entry of whose name in the Dental Register was said to have been obtained fraudulently and incorrectly. The practitioner was alleged to have been articled to Samuel Haworth, dentist, of Mill End, New Church, near Manchester, the articles expiring on January 28th, 1879, and the amount of premium paid being £30. That such request for registration was accompanied by a copy of the articles referred to, and forwarded by Thomas Maden to the Registrar with a postal order for the registration fee.

That Samuel Haworth, by letter dated April 4th, 1884, addressed to the Registrar, certified that the agreement made between himself and Thomas Maden had been duly fulfilled.

That Thomas Maden was born on October 4th, 1865, and was therefore but eleven years and four months old at the time he was alleged to have been articled, and thirteen years and four months old at the expiration of the articles. During the greater part of the two years of his alleged articles he attended as a scholar at a national day school, and for another portion of the time he was working at a cotton manufacturer's. Mr. Farrer pointed out that under the Dentists' Act the Council had power to erase a name the entry of which had been fraudulently and incorrectly obtained, and that the report of a Committee of the Council on the facts of the case might be deemed conclusive for the purpose of exercising such power. It was the opinion of

Mr. Muir Mackenzie that the name could be erased without citing the practitioner. Thomas Maden's father, a Yorkshire labourer, had been applied to on the subject, and his simple answer was, "Let them as put it on take it off." (Laughter.)

The Council deliberated upon the case in private, and passed a resolution directing that Thomas Maden's name and qualification be removed from the Dentists' Register.

This concluded all the business specially relating to dentistry.

EXAMINATION QUESTIONS.

THE following questions were given at the recent examinations for the L.D.S. :—

ROYAL COLLEGE OF SURGEONS OF ENGLAND, NOVEMBER 1, 1886.

ANATOMY AND PHYSIOLOGY.

1. Describe the relations of the Submaxillary Gland.
2. Mention the nerves which are distributed to the Tongue, Jaws, and Palate. Give their several functions.

SURGERY AND PATHOLOGY.

1. What are the peculiarities of the teeth met with in the subjects of inherited syphilis? Distinguish between those of the first set and those of the second set.
2. Describe the principal morbid conditions which may affect the gums.

DENTAL ANATOMY AND PHYSIOLOGY.

1. Describe the dentition of ruminants, mentioning any salient characteristics in the articulation, muscles, mastication, and salivary glands.
2. From what tissues are teeth derived? Give examples of correlation of growth between skin, hair and teeth.
3. Describe the stellate reticulum of the enamel-organ. What part does it play in the development of enamel.

DENTAL SURGERY AND PATHOLOGY.

1. What dental irregularities are frequently inherited? How far does this affect their treatment?
2. What are the causes of excessive sensibility of the dentine? By what means can it be modified?

3. Enumerate the substances used for taking impressions of the mouth. Describe the methods of using them, and their respective advantages.
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ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

Questions at 2nd professional examination, October 7th, 1886.

SURGERY.

1. What are the symptoms and pathology of Rickets?
2. What are the chief modes, direct and indirect, of arresting Hæmorrhage?

MEDICINE.

1. What are the symptoms by which you would distinguish between Gout, Rheumatism, and Neuralgia; and what would be your treatment?
2. What is Diabetes Mellitus? What are its symptoms and treatment?

DENTAL ANATOMY AND PHYSIOLOGY.

1. Describe the dentition of the Rodentia, tabulating the formulæ in the order; what peculiarities are found in the enamel and dentine?
2. From what source is Cementum developed? Give its microscopic structure, and name any order, family or species, among the Mammalia, in which it is strongly marked?
3. Describe the processes involved in the absorption of teeth, temporary and permanent; and state how the persistence of the former will cause irregularity in the latter.

DENTAL SURGERY AND PATHOLOGY.

1. Mention some of the reflex affections which may be produced by diseased teeth.
 2. What teeth in the permanent set are most liable to suppression? Give the probable causes of their absence.
 3. In what direction would you apply force in the removal of the permanent teeth? When and under what circumstances would you use an Elevator?
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PASS LIST.**ROYAL COLLEGE OF SURGEONS OF ENGLAND.**

THE following gentlemen having passed the necessary examinations, were admitted Licentiates in Dental Surgery, at a meeting of the Board of Examiners, on November 3 :—

J. S. Acton, Barnes Common ; J. P. Smith, Chelsea ; H. Williams, West Kensington ; and J. A. S. Tibbs, Brighton, of Middlesex Hospital.

A. E. Baker, Oakley Square ; A. T. Croucher, Clapham Road ; A. Kendrick, St. John's Wood ; F. M. Ludbrooke, West Brompton ; H. J. Moore ; and J. Woodhouse, Oakley Square, of Charing Cross Hospital.

C. A. Pattinson, Highgate, of Westminster Hospital.

Four candidates were referred.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

At the October sittings of the Examiners, Mr. Alfred Stevens, London, passed the first professional examination for the License in Dental Surgery ; and the following gentlemen passed the final examination and were admitted L.D.S. Edinburgh :—William John Fisk, Kilburn ; Arthur Farish Benson, Yeovil ; Arthur Cocker, Yorkshire ; and Charles Maclean Cunningham, Cambridge.

One candidate was referred.

GOSSIP.

MR. G. O. WHITTAKER has been appointed Dental Surgeon to the Victoria Dental Hospital, Manchester.

THE National Druggists' Association report states that quinine was used in the United States during the past year to the total amount of 81½ tons.

ACCORDING to the observations recorded by Mr. V. Ball, Hon. Sec. of the Royal Zoological Society of Ireland, the average duration of a lion's life is from 12 to 14 years. A prolific lioness died in the Society's gardens at the age of 16 years, and apparently of old age.

MR. HENRY J. MOXON, L.D.S.I., has been appointed Dental Surgeon to the Westminster Parochial Schools.

MR. W. LAPRAIK, F.C.S., F.I.C., has been appointed Lecturer on Metallurgy at the National Dental College, *vice* Alfred Tribe, deceased.

UPON the question, "Are Small-Pox and Cow-Pox one and the same disease?" Dr. George Fleming, Principal Veterinary Surgeon of the Army, writes to *The Lancet* as follows:—In the Harveian Oration recently delivered by Dr. Pavy, we find the following statement: "It may now be regarded as an accepted conclusion that vaccine lymph is the virus of small-pox, modified by transmission through the cow." In dissenting from this, Dr. Fleming says, that some time since, twelve heifers were purchased by the Local Government Board and lodged in the Brown Institution, where they were inoculated by Dr. Klein, under the supervision and direction of Mr. Ceely; and though small-pox matter was literally poured into the incisions, and the greatest care was observed throughout, yet cow-pox was not developed in any of the animals. Similar failures have attended all other attempts, when these have been made openly and by two or more individuals. A few years ago, I stated that small-pox and cow-pox were different and antagonistic diseases, and nothing has transpired since then to cause me to change my views; on the contrary, the important discoveries which have been made in microbiology (if I may use the term) have confirmed them in every respect.

THE number of letters delivered in the United Kingdom during the year ending March 31st, was 1,403,000,000. Of newspapers, book packets and circulars 490,000,000 were delivered, and of post-cards, 172,000,000 were delivered, 12,000,000 more than in the previous year. The grand total of all the different items which passed under the hands of the Post Office officials within the year was 2,091,183,822.

A SMOKING CONCERT was given on the 10th ult. by the Students' Society of the National Dental College; and the Students' Society of the Dental Hospital of London Medical School also gave a Smoking Concert on the 11th ult. Both events were successful.

A CASE of "Unilateral Progressive Facial Atrophy" was shown before the Midland Medical Society, on October 20th, by Dr. Suckling. The patient was a woman aged forty-two. The affection commenced gradually when she was about eighteen years of age, when the left side of the face was noticed to be different from the right. The bones were atrophied on the left side; the horizontal ramus of the inferior maxilla was an inch shorter on the left than on the right side; the fat had almost completely disappeared, the eyeball being retracted and there being deep fossæ above and below the zygoma. The hair disappeared over the left half of the front of the skull. There were two well-marked grooves on the left side of the forehead in the situation of the supra-orbital and supra-trochlear nerves. The temperature of the left side of the face was a degree higher than the right; sensation was unaffected and the general health unimpaired.

THE authorities at the Middlesex Hospital Medical College have decided not to sign the schedule for hospital practice unless the medical students have attended for three months the practice of the Dental Department. This is a step in the right direction, and is calculated to give the general practitioner a better knowledge of Dental Surgery.

ON the 9th ult. an inquest was held at the Huddersfield Infirmary on the body of a man who had died at that Institution whilst undergoing, under chloroform, an operation for cancer in the mouth. Medical evidence was given that death arose from failure of the heart's action, brought about by the administration of the chloroform, and the jury found a verdict accordingly, adding that the chloroform was administered properly

IT is understood that Mr. Charles S. Tomes, F.R.S., will be nominated as President of the Odontological Society for the ensuing year.

THE story, "Thurley Tighe," which for nearly two years has been appearing as a supplement to the DENTAL RECORD, will shortly be published as a separate volume by the Dental Manufacturing Co.







BINDING LIST OCT 15 1927

H.R. Abbott
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